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Establishing the Factors Related Domestic Burglary

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ESTABLISHING THE FACTORS RELATED TO DOMESTIC BURGLARY

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Abstract

This thesis explores some of the initial cognitive/affective factors potentially to be linked to burglary. The thesis has leant heavily upon research in other areas of forensic psychology, exploring the factors that have been found to be related to other offences (e.g. cognitive distortions, empathy, human needs). Over two studies, several factors were tested for their association to burglary. The first study highlights the associations between the proclivity to commit burglary, and burglary-related cognitive distortions, general criminal cognitive distortions, empathy (both cognitive and affective), and human needs. The study used a sample of non-offenders (N = 306). The findings suggest that burglary and general criminal cognitive distortions, as well as affective empathy, were associated with the proclivity to burgle. Furthermore, using regression analysis it was found that burglary cognitive distortions and general criminal cognitive distortions predicted burglary proclivity. The second study investigated into whether burglary proclivity, burglary cognitive distortions, burglary empathy, and emotional reactivity were associated with offence behaviours during a simulated virtual burglary. A sample of non-offenders simulated a first-time burglary offence (N = 51). The results have shown that burglary cognitive distortions, affective empathy, cognitive empathy, as well as confounding variables, related to Virtual Reality were associated with burglary behaviours. Additionally, the association between burglary typologies and burglary cognitions were tested and it was found that a subscale of burglary cognitive distortions was associated to an existing burglary typology. Overall both studies have begun to establish the association between burglary cognitions and the proclivity to commit burglary, as well as burglary offence behaviours. These initial factors can help establish a new theory regarding burglary, which in turn can aim to better work with burglars in a preventative, rehabilitative and assessment manner.

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1

General Introduction

What We Know About Burglary

Burglary is one of the most high-volume crimes in the United Kingdom. The Crime Survey for England and Wales has shown that, over the last three decades, burglary offences have begun to decline in prominence. For example, in 1993, burglary rates peaked at 2,445,000 offences, yet by 2016, they had dropped to the lowest recorded (i.e., 650,000 offences). More recently, however, there is evidence showing an increase in offence rates. In 2018, for example, there were 697,000 burglary offences reported (Office for National Statistics, 2018). Given this apparent resurgence in burglary, this thesis aims to expand the current literature on burglary in order to develop a basis for new theoretical insights and rehabilitative work that could be conducted with burglary offenders.

Burglary is legally defined in the United Kingdom as:

"(1) A person is guilty of burglary if—(a) he enters any building or part of a building as a trespasser and with intent to commit any such offence as is mentioned in subsection (2) below; or (b) having entered any building or part of a building as a trespasser he steals or attempts to steal anything in the building or that part of it or inflicts or attempts to inflict on any person therein any grievous bodily harm.

(2) The offences referred to in subsection (1)(a) above are offences of stealing anything in the building or part of a building in question, of inflicting on any person therein any grievous bodily harm therein, and of doing unlawful damage to the building or anything therein" (Theft Act, 1968).

Based on this definition, there are appear to be three classes of actions that constitute burglary, all of which involve trespassing to either: (1) take another's possessions, (2) assault an individual, or (3) vandalise an individual's property. The present research

will predominantly focus upon the first class of actions (i.e., taking another's possessions), as this is the most common characteristic of burglary.

Through simulations of a burglary offence, it has been found that the potential loot from a burglary could be anywhere from £2,200 to £4,875 (Nee et al., 2015; Nee, van Gelder, Otte, Vernham, & Meenaghan, 2019). This poses a significant financial impact upon the victims and wider society. Moreover, whilst Harris, Pedneault, and Knight (2013) found that two thirds of their sample of burglaries consisted of no items being taken, burglary offences have considerable negative psychological effects on victims. Common effects include feeling unsafe and insecure, hostile, confused, tired, depressed, and anxious (Beaton, Cook, Kavanagh, & Herrington, 2000; Maguire, 1980). In more severe offences, victims have even reported feeling post-traumatic stress symptoms (Angel et al., 2011). In the case of elderly victims, it has been found that being burgled decreases physical and mental health, even leading to death (Home Office, 2003).

The main theory regarding burglary at the current time is the theory of burglar expertise (Nee & Meenaghan, 2006). This theory suggests that burglars become experts at offending over repeated commissions of the crime. As this expertise develops, the burglary process becomes automated. Therefore, as the offender searches, certain cues become automatically recognised. This includes the search for items within the house (Nee et al., 2015; Nee et al., 2019). This theory has been built on decades of previous research, the main aim of which has been to establish the specific behavioural patterns of burglars and why they target specific houses. This can be seen in Bennett and Wright's (1984) work, which identified that burglars look for four specific clusters of cues when identifying potential targets; namely, occupancy, surveillability, accessibility, and security. This then became the focal point of the

literature, which focused on exploring these 'attractive' cues (Bernasco & Luykx, 2003; Cromwell, Olson, & Avary, 1991; Garcia-Retamero, & Dhami, 2009; Wright, Logie, & Decker, 1995). The issue with the theory of expertise is that it offers little insight into why burglars offend and how this can be used to prevent/reduce offending. If a burglar's expertise could be reduced, it may dissuade them from offending. However, it arguably does not combat the core reasoning for offending, meaning that the offender may revert to offending again. The risk factors will still remain and the needs that are being fulfilled by the offence will still need fulfilling. Thus, these factors and needs must be identified and examined in terms of their link with burglary behaviour. Therefore, these factors can then be focused upon in a preventative and rehabilitative manner.

Factors Linked to Burglary

Empathy is becoming a focal point in burglary research. This focus is built upon comments by convicted burglars, who suggested that they would not target certain groups. This includes those they considered vulnerable, such the elderly (Rengert & Wasilchick, 2000). More recently, Roth (2018) found that burglars did not want to burgle a house with children's toys out in the front garden nor did they want to burgle a disabled person's home. Taylor (2017) similarly found that burglars wanted to avoid targeting the elderly, as well as those with low social economic status. Meenaghan, Nee, van Gelder, Otte, and Vernham, (2018) found that when burglars were burglarising a house in Virtual Reality (VR), they showed trepidation in entering the child's bedroom, with some vocalising their discomfort about taking anything from the room. Taylor (2014) additionally found that burglars reported that certain types of burglaries were immoral, specifically 'creeper burglaries' (i.e., the burglary of an

occupied house) and ‘distraction burglaries’ (i.e., where one individual distracts the occupier while another gains entry to the house), highlighting the potential influence of moral cognitions on empathic reactions. Low levels of empathy have been found to be linked to anti-social behaviours and even psychopathy in juvenile offenders (Asscher et al., 2011). It was additionally found that burglars who committed more burglary offences reported lower levels of empathy (Jolliffe & Farrington, 2007). It can be argued that low empathy influences an individual to offend for the first time, in conjunction with other aetiological factors. Thus, empathy seems to be a complex factor in burglary and needs to be unpacked further, especially regarding what hinders and what allows offenders to take from more vulnerable people and groups.

Cognitive distortions are typically seen within forensic populations and have been found to be pertinent to the commission of an offence. Bumby (1996) suggests that distorted beliefs allow for the denial/minimisation of guilt, and/or the justification of deviant or antisocial behaviours. This is similar to Sykes and Matza’s (1957) concept of ‘neutralization techniques’ that precede criminal behaviour. They identified five such techniques; namely, (1) Denial of Responsibility; (2) Denial of Injury; (3) Denial of the Victim; (4) Condemnation of the Condemners; and (5) Appeal to Higher Loyalties. Given that these distortions/neutralisations are thought to influence offending behaviour (Ó Ciardha & Gannon, 2011), they could help explain some of the motivational aspects and pre-offence justifications for burglary. However, cognitive distortions (or techniques of neutralisation) have not yet been examined in relation to burglary, but they have been found to be pertinent in understanding sexual offending, domestic violence, and general anti-social behaviour (Bumby, 1996; Henning, Jones, & Holdford, 2005; Howitt & Sheldon, 2007; Wallinius, Johansson, Larden, & Dernevik, 2011).

It has been suggested that not all cognitive distortions are criminogenic, in that, they are related to offending but do not predict the risk to offend (Hanson & Morton-Bourgon, 2005). The attitudes that do predict risk are usually heavily influenced by other factors, such as improper scripts for relationships (Marshall, Marshall, & Ware, 2009). Indeed, burglary offenders typically commit a high volume of offences and are, thus, often considered "career criminals" (Vaughn, Delisi, Beaver, & Howard, 2008). It has even been found that burglars will leave a full-time employment and instead burgle for their main source of income (Rengert & Walischick, 2000). Taylor (2014) found one of the potential mechanisms for the justification for burglar offending. That is, burglars showed evidence of redeveloping their own morals in order to guide their offending behaviour. In can, therefore, be argued that this redevelopment of morals helped them to justify their actions, alongside techniques of neutralisation. In turn, this guided their motivations for committing burglary and the strategies they enacted in a manner that adhered to their newly formed personal morals. Tying this with the cognitive distortion literature, it can be argued that burglars' distorted cognitions may influence the decisions they make in life, which in turn increase their likelihood of offending (e.g., believing that they can earn a living via burglary, or that burglary is the only means to do so). Such decisions would also be influenced by the common life goals they hold.

The Good Lives Model (GLM; Ward & Stewart, 2003) has become a focal point in offender rehabilitation in recent years. Primarily, the GLM has been used with sex offenders. It uses a strength-based approach, in that, rather than seeking to fulfil their needs ('goods') in an anti-social manner, offenders are instead guided to fulfil them in a pro-social manner (Ward & Fortune, 2013). The model highlights the need for a positive life that is focused on emotional wellbeing, thus, helping offenders learn

how to live an offence-free life. It is argued that there is a predisposition to seek a range of primary human goods that help lead to a good life (Laws & Ward, 2011). Taylor (2017) applied the GLM to a sample of burglary offenders, successfully reducing both their burglary offending and their general offending. Using the 11 primary human goods of the GLM, Taylor (2017) was able to identify how these burglars were using their offending to achieve a 'good life'. One of the key primary human goods related to their burglary was *Excellence in Work*. It was found that many burglars were seeking pride in their offences and considered it as a job. Similarly, Rengert and Wasilchick (2000) found that some burglars had quit their jobs to be a full-time burglar as normal working hours conflicted with when they wanted to burgle. This highlights that, for some burglars, burglary is not just an offence but more of a lifestyle. Yet, it is not only the needs that are being fulfilled that could be leading to the choice to offend but additionally the needs that are not being fulfilled could lead to the choice to offend (Taylor, 2017). Therefore, it could be argued that lacking fulfilment in these goods may make an individual seek to fulfil them with potentially deviant means. Thus, these goods are being explored to find if there is an association with committing a burglary offence.

The Use of Virtual Reality in Burglary Research

Recent research on burglary has begun to focus on offending behaviours via the use of VR. Nee et al., (2015) originally compared a mock house against a virtual replica of the same house. After finding little to no differences between the groups, it was surmised that VR was a valid replication for mock-burglaries. Following this, van Gelder et al., (2017) used VR to test whether a sample of non-offenders would become aroused by the burglary task set upon them. Using pulmonary data, it was found that,

at certain points during the mock burglary, higher signs of stress were shown. For example, an increase in heart rate was observed when participants entered the home and when an alarm was sounded. This suggests a level of immersion felt when in VR and how it has the capability to replicate reality.

Meenaghan et al., (2018) then applied van Gelder et al's. (2017) simulation to a sample of convicted burglars. During the simulation, the burglars were asked to think aloud as they offended, providing insight into why they committed certain actions. Many offenders reported that the simulation was realistic and was like reliving their offending. Regarding the items, participants seemed to be divided on what they took. Some focused on high value items (e.g. phones, tablets) as they were deemed to always be in high demand, whilst others displayed a concern for the security measures of high value items (e.g. GPS tracking, automatic photos) leading to them being ignored. There was also commendation to the reality of the simulation despite, being completed on a laptop opposed to a Head-Mounted Display (HMD), participants commented that it induced the same level of arousal as reality.

Most recently, Nee et al. (2019) compared a sample of expert burglars with a sample of other offenders, and non-offenders in terms of the items taken in a VR mock burglary. Expert burglars were defined by a mixture of self-reported burglary data, and signs of their expertise being verbalised during the virtual burglary. Overall, the findings revealed that there were significant differences (total number of items taken, weight, volume, number of mid-value items, and the number of low value items) of the burglary behaviours between the non-offenders and the expert burglars, but not other offender comparison group. It was expected that as experience with burglary increased so would the efficiency of committing a burglary. However, there were minimal differences between the groups, especially regarding high-value items.

Moreover, the variables that were different between groups showed a very a small effect size, suggesting the difference may be due to chance (Hill, Bloom, Black, & Lipsey, 2008). As such, this study does not conclusively support the idea that burglars have an expertise when it comes to their offending behaviour. Rather, it seems specific to house target selection. Yet, this still does not provide any insight into why people burgle or show these specific biases, nor does it provide any clear ideas for how to reduce burglary offences. The objective of the virtual burglary research (Nee et al., 2019) is to highlight the expertise held by burglars regarding how to burgle and what to target. Thus, if burglars are experts at offending, an insight can be made into what burglars are identifying and their decision-making process (Nee et al., 2019). It is argued an effort can be made to educate the general population to help prevent burglaries and reduce the amount taken from the burglary, as well as working with offenders to reduce this offending. Yet there has been little support for this theory.

Thesis Aims

Whilst there has been a consistent decline in burglary offences over the last two decades there is now evidence for an increase in offence rates. Thus, it is time for a resurgence in efforts to help reduce burglary using similar strategies as before, as well as strategies used for different types of offenders. Whilst much of the literature around burglary is steeped in preventative perspectives, there is yet to be a robust perspective to investigating how a burglar's beliefs, attitudes, and schemas are guiding their offending. This has been found to be extremely effective in most other offences, as it helps guide rehabilitative models by identifying factors core to offending (Andrews, & Bonta, 2010). By understanding what drives a burglar to offend, more efforts can be made to help these individuals have a choice not to burgle but instead receive help and support in treatment. To do this, it is necessary to identify the factors that are

related to burglary by investigating into the factors that can statistically predict the inclination to commit a burglary offence. As well as the factors related to the decision-making process during a first-time burglary offence, therefore further insight can be understood into why burglar's take certain items and leave others.

2

Investigating whether Empathy, Cognitive Distortions, and Human Needs are related to Burglary Proclivity

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Abstract

This study investigated whether the proclivity (likelihood) to commit a burglary offence is influenced by; empathy (both global and burglary-specific), general criminal cognitions, burglary-specific beliefs, and common human needs. The study was conducted online and adopted a within-subjects, cross-sectional design, whereby the cognitive/affective variables were the independent variables and participants' burglary proclivity score was the dependent variable. Data were collected via a combination of new and standardised questionnaires administered online, distributed on Amazon's MTurk (N = 306). Specifically, the questionnaires included; (1) Burglary Cognitive Distortions Scale, (2) Human Needs Scale, (3) Burglary Empathy Measure, (4) Psychological Inventory of Criminal Thinking Styles-Laypersons-Short Form, and (5) Burglary Proclivity Scale. Exploratory factor analysis of the Burglary Cognitive Distortions Scale produced two factors: (1) Acquisitive Entitlement, and (2) Survive by any Means, with two items that did not load on to either factor. Regression analyses revealed that both general and burglary-specific cognitive distortions statistically predicted burglary proclivity. These results suggest that the proclivity to burgle is partially explained by cognitive distortions, and that affective empathy is associated with the proclivity to burgle. These results aid theoretical advancements, highlighting what can be targeted to help reduce the chances of an individual committing an offence. This has implications in clinical and forensic settings in terms of evaluating burglary-related beliefs.

Introduction

Burglary causes great distress to its victims, as well as major financial costs. For example, research suggests that the average value of burglars' 'loot' is around £2200 (Nee et al., 2019). In addition, burglary is a high-volume crime, with recent occurrences showing a rise in the UK (e.g., from 409,999 in 2016 to 432,267 in 2018; Office for National Statistics). Based on these observations, action must be taken to reduce burglary offences and prevent any further increase. One approach to this end is to identify and understand the aetiological factors that can lead to committing a burglary offence. Burglars are argued to have an expertise in burglary (Nee, & Meenaghan, 2006), this theory suggests that over the course of their offending that burglars become more skilled, developing scripts for how to burgle, the best targets to burgle, and an automatised search strategy where the focus can be pinned on detection instead of on the search. This theory is based on previous research in burglars that highlights the 'attractive' properties for a potential target (e.g. Logie, Wright, & Decker, 1992). Burglars have a diverse offending history, typically committing many other crimes that relate to offending to their burglary (e.g. Fraud, Theft, drug-related offences) (Vaughn, DeLisi, Beaver, & Howard, 2008).

To further our understanding of burglary, we can draw upon what we know about offenders in general. For example, various cognitive factors (i.e., empathy, distorted beliefs, and psychological needs) are known to be important in understanding the aetiology of offending (Andrews, & Bonta, 2010; Ward, & Stewart, 2003). As such, they are likely to be important in understanding burglary. Moreover, focusing on the proclivity to burgle (not just those convicted of burglary offences) may be a useful route to take, as it allows for possible causal and/or mediating factors to be identified.

Therefore, the present study aims to examine the relationship between cognitive factors and burglary-related proclivity.

Empathy in burglars

Empathy has been found to be an important factor in criminality, Bock, and Hosser (2014) found that cognitive empathy deficits at a young age predicted higher chances of recidivism. However, the role empathy plays in offending is a complex one. This is because, while empathic processes are automatic, they can also be shaped by top-down processes. There are many definitions for empathy due to empathy being an abstract concept. Empathy is comprised of two distinct subcomponents: (1) cognitive empathy and (2) affective empathy. Cognitive empathy largely refers to perspective-taking, whilst the affective component refers to an emotional experience triggered by an emotional provocation (Cuff, Brown, Taylor, & Howat, 2016). Moreover, empathy is considered an affective response that is controlled via the relationship between state influences and traits. This affective response is guided by the cognitive perspective and understanding of the emotional provocation, whilst understanding it is not the individual's own feelings (Cuff et al., 2016). It is important to distinguish these components when applied to offending behaviour. For example, Marshall, Hamilton, and Fernandez (2001) suggest that, while offenders will show cognitive empathy and will be able to recognise its effects, they will show a lack of affective empathy. Marshall, Marshall, and Ware (2009) suggest this lack of affective empathy is due to the cognitive distortions held by the offender, protecting them from feeling the negative consequences of their crime. It has also been found that offenders typically lack empathy for their own victims, whilst maintaining empathy for a victim of sexual abuse (Fernandez, Marshall, Lightbody, & O'Sullivan, 1999). This further highlights

the way cognitive distortions can minimise empathic responses (Blake & Gannon, 2008).

Interview research has revealed that empathy is dynamic in burglars, in that, there are differences between many burglars as to what is "okay" to steal and what is "not okay" (Bennett & Wright, 1984; Palmer, Holmes, & Hollin, 2002). Additionally, whilst some burglars will victimise almost anyone, some burglars claim to only steal from those that can afford it (Taylor, 2017). Furthermore, it has been found that some burglars have an issue with stealing from children's bedrooms (Meenaghan et al., 2018), as well the elderly (Taylor, 2017). Roth (2018) explored a similar aspect using qualitative responses about burglarising the disabled. He found that, while most burglars recognised this as a morally charged decision, they also knew that it meant the house was rarely unoccupied, meaning there was little chance to burgle the property. Roth (2018) also suggests that these findings could be due to social desirability, in that, these offenders were 'faking good' so that they may avoid the label of a "criminal". At present, it is still unclear as to whether there is a deficit in empathy in burglars, or whether that they have a complex morality that guides their actions.

Human Needs in Burglars

To understand burglary, it is also necessary to explore the needs of burglars. This can be approached from the perspective of the Good Lives Model (GLM; Ward & Stewart, 2003). The GLM proposes that human beings seek after primary goods, to allow an individual to possess a 'good life'. Each human good can be sought after in a pro-social or anti-social manner which will promote the wellbeing of the individual. The aim of the GLM is to use strength-based rehabilitation to specifically target constructs

that allow the offender to capture Primary Human Goods (PHG) through their offending behaviours, and oppositely enable offenders to reach these goods in a manner that is considered pro-social. This is also achieved via not only targeting the offender's personal values but additionally their external influencers. The GLM has been used for multiple offender groups and has success in rehabilitative efforts. The PHGs are conceptualised by the assumption that every person aims to achieve varying needs that are based on certain internal and external influences (e.g. mental states, and experiences).

Taylor (2017) highlighted how the GLM can be applied to the understanding of burglary and the rehabilitative management of burglars. Taylor (2017) conducted a series of interviews with incarcerated burglars, exploring how their offending behaviour allowed them to achieve specific needs or PHGs (Ward & Stewart, 2003). As mentioned above, these primary needs can be attained in either a pro-social or anti-social manner. Taylor (2017) found that, out of all of the PHGs, some of them were deemed more pertinent regarding to this current study than others. These were *Excellence in Work*, *Excellence in Agency*, *Inner Peace*, and *Pleasure*. Taylor's (2017) findings provided an insight into how burglars may go about attaining these particular needs through their offending behaviour. For example, *Excellence in Work* was found to be achieved because most of the burglars (in the sample) believed that their offending was a form of 'work'.

Many burglars in Taylor's (2017) study also talked about this particular need with pride, as they had few qualifications or real jobs to otherwise attain it. Thus, they found pride in their criminal activities (Taylor, 2017). Arguably, this sense of pride may reinforce their cognitive distortions and beliefs about burglary. If this was the case, it would show how various factors (i.e., needs and distortions) can interact to

influence further offending. It also highlights the need to therapeutically address their views on how to achieve certain needs in a pro-social manner, to live a successful, offence-free life. This links to the theory of expertise in burglars (Nee and Meenaghan, 2006), emphasising that if pride is felt then they may strive to fulfil this pride with each offence. Additionally, it can be argued that referring to burglars as experts may only serve to exacerbate this sense of pride.

Cognitive Distortions in Burglars

Cognitive distortions in offenders are thought to be distorted beliefs that help justify immoral or anti-social actions and, therefore, minimise any potential guilt (Bumby, 1996). Cognitive distortions are believed to be an aetiological factor in offending and can be either general (i.e., related to general anti-sociality) or offence-specific (i.e., related to a particular offence). In relation to sexual offending, Szumski, Bartels, Beech, and Fisher (2018) state in their multi-mechanism theory that cognitive distortions can arise from one of three mechanisms. Mechanism I exerts a distal effect on offending, in that, distorted implicit beliefs produce a misunderstanding of social cues, which in turn, guide one's life-course in a manner that increases their risk offending (in combination with other risk factors). Mechanism II exerts a proximal effect whereby cognitive distortions either serve as an immediate pre-offence justification to commit a criminal act in order to obtain a specific goal, or temporarily arise due to the visceral effect of an emotion or arousal. Mechanism III describes a post-offence effect, whereby cognitive distortions serve to rationalise, minimise, or deny the negative feelings that result from the offence. Burglary cognitive distortions have not yet been investigated therefore; other theories are being used to help guide research into burglary cognitive distortions.

So far within the literature, burglary-specific cognitive distortions have not been examined. However, from existing qualitative research, it is clear that some burglars harbour distorted beliefs that aid their offending 'I got nicked up in "Affluent Area" because I used to think they were rich and I was poor and to me that justified it. I didn't feel as bad, they have millions anyway' (Taylor, 2017, p. 443). Combining this observation with Szumski et al.,'s (2018) Multi-Mechanism Theory outlined above, it can be argued that some people hold distorted beliefs that increase their proclivity and risk of committing a burglary offence (Mechanism I).

Proclivity

Offending proclivity has become of increased interest in the forensic literature, as it highlights some of the important factors that can potentially drive an individual to offend before they have ever committed the offence. Proclivity measures have been used for many different offence types, including animal abuse, firesetting, child sexual abuse, rape, and revenge pornography (Abrams, Viki, Masser, & Bohner, 2003; Alleyne, Tilston, Parfitt, & Butcher, 2015; Gannon & Barrowcliffe, 2012; Gannon & O'Connor, 2011; Pina, Holland, & James, 2017). These proclivity measures are typically comprised of five or six vignettes describing different scenarios of a particular offence. Respondents then state how likely they would be to do the same behaviour, as well as how aroused, excited, and/or satisfied they would be if they did the same.

These proclivity measures are useful as they provide a way to examine the factors that may influence different forms of offending. For example, empathy was found to be negatively related to the proclivity to abuse animals (Alleyne et al., 2015),

and was also found to mediate the link between male dominance and sexual harassment proclivity (Stillman, Yamawaki, Ridge, White, & Copley, 2009). Further, cognitive distortions have been found to be associated with the proclivity to offend and have been extensively researched with regards to rape proclivity (Abrams, Viki, Masser, & Bohner, 2003; Malamuth, 1981). There is little known about the proclivity to burgle and the factors that affect it. This formed the basis for the present study.

The Present Study

Using a sample from the general population, this study aims to: (1) identify some of the key beliefs that may justify burglary, (2) examine the proclivity to commit an act of burglary, and (3) establish whether this proclivity is associated with empathy (global and/or burglary-specific), cognitive distortions (general and/or burglary- specific), and primary human needs.

It is hypothesised that a greater burglary proclivity will be associated with: greater burglary-related cognitive distortions (Hypothesis 1), greater general criminal cognitive distortions (Hypothesis 2), lesser cognitive empathy (global and/or burglary-specific) (Hypothesis 3), lesser affective empathy (global and/or burglary-specific), (Hypothesis 4), and a lower attainment of primary human needs (Hypothesis 5). Finally, that each factor will predict a significant amount of variance in burglary proclivity scores (Hypothesis 6).

Methodology

Participants

The study involved a sample of 306 participants aged between 18 and 78 years of age (M = 38.25, SD = 13.07). The sample consisted of 196 self-identified females, 106

self-identified males, two self-identified non-binary participants, and two self-identified transgender participants. The majority of the sample self-identified as White (72.2%), with the remainder identifying as Black (5.2%), Hispanic (4.6%), Asian (3.3%), or 'Other' (14.7%). Participants were recruited and monetarily compensated through Amazon's Mechanical Turk (MTurk).

Design

This online study used a within-subjects, cross-sectional design, whereby cognitive distortions, empathy, and human needs were the independent variables, and participants' burglary proclivity scores was the dependent variable.

Materials (each measure can be found in the Appendix).

Burglary Cognitive Distortions Scale (BCDS): This new scale was developed to measure distorted beliefs related to burglary. The initial measure consisted of 36 items based upon a thorough review of qualitative burglary literature. For example, qualitative data gathered from interview studies with burglars helped to highlight possible distortions (e.g. Bennett &Wright, 1984; Mullins & Wright 2003; Taylor, 2018), as well as any constructs relating to burglary-related cognitive distortions. Each item presented a distorted statement related to burglary. The endorsement of each statement was rated using a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The psychometric data for this new measure is reported below in the Results section.

Burglary Empathy Measure (BEM): Based on the Rape Empathy Measure by Fernandez and Marshall (2003), this measure is comprised of a General Cognitive Empathy subscale (30 items), a General Affective Empathy subscale (20 items), a burglary-specific Cognitive Empathy subscale (30 items), and a burglary-specific Affective Empathy subscale (20 items). The items on the general empathy subscales refer to a car crash victim vignette that was presented, while the items on the burglary-specific subscales refers to a burglary offence vignette (where the participant imagines being the offender). The BEM has been further altered to remove the reference to sex and female victims so that the measure can be gender neutral and clearly focuses upon the effects of burglary. Higher scores on the BEM indicate higher levels of empathy. The BEM showed an overall high Cronbach's alpha, with the cognitive subscales having a lower alpha than their affective counterparts (see Table 1).

Human Needs Scale (HNS): This new scale has been designed to assess the acquisition of the 11 human goods (or needs) outlined in the GLM (Ward & Stewart, 2003). This rehabilitative framework states that these needs are important for psychological wellbeing but can lead to offending behaviour when sought after in an antisocial manner. The HNS consists of 15 items relating to each human need, (1) Healthy living, (2) Good Basic Functioning, (3) Basic Survival, (4) Knowledge, (5) Excelling at Work, (6) Excelling at Play, (7) Personal Choice and Independence, (8) Peace of Mind, (9) Friendships, (10) Intimate Relations, (11) Familial Relations, (12) Community, (13) Spirituality, (14) Happiness, (15) Creativity. Some items were renamed to aid comprehension. Furthermore, some items (e.g., *Life* and *Relatedness*) were spilt into further categories to highlight the specifics of each need. For this scale, participants rated (on a 7-point scale) the extent to which they have achieved each need, as well as

how they typically go about attaining it (via an open-ended question). Small descriptions were also provided to explain each need. The measure was found to have a high Cronbach's alpha (see Table 1).

Psychological Inventory of Criminal Thinking Styles-Layperson-Short Form (PICTS-L-SF). Created by Mitchell, Bartholomew, Morgan, and Cukrowicz (2017), this measure assesses general crime-related beliefs. This version of the measure is designed to investigate these cognitions within non-offenders, making it appropriate for the present study. The measure consists of 35 items scored on a 4-point Likert scale (1 = disagree to 4 = strongly agree). In the present study, the PICT-L-SF was found to have high internal consistency or Cronbach's alpha (see Table 1).

Burglary Proclivity Scale (BPS): A set of newly developed vignettes were used to assess participants' likelihood to commit burglary. These vignettes were based upon real-life case studies and news reports, as well as prior proclivity measures (Alleyne et al., 2015; Bohner et al., 1998). Three of the vignettes described opportunistic burglary offences, while the other three described planned burglary offences. Each vignette is followed by a set of questions. These questions measured participants' level of excitement and fulfilment towards the scene depicted in the vignette, as well as their level of behavioural propensity to do the same behaviour. These questions were scored on a 7-point Likert scale ranging from 'Very unlikely' (1) to 'Very likely' (7). A score of above 1 indicates a proclivity to burgle as it is not an absolute aversion. The overall score on the BPS was found to have a high Cronbach's alpha, as was each subscale (see Table 1).

Procedure

The study was conducted online using Qualtrics. Participants were each shown a brief that described the nature of the study, before being asked formally to provide their consent to take part. Participants were then asked to state basic demographic information (e.g., age, gender) before completing each of the main measures. The BCDS items were randomised to prevent any grouping from when the items were inputted during its creation. For each participant, the order of the measures was presented in a randomised order, except for the BPS, which remained last in the series. Finally, participants were debriefed before being compensated, and then thanked for their participation.

Results

Descriptive Statistics

Table 1 shows the descriptive statistics for the overall scores and subscales of each of the measures. It can be observed that the three different proclivity scores, BCDS its two factors, and PICTS-L-SF are low when compared to their possible ranges. Furthermore, there is little difference between the two different types of proclivity. As such, the overall score will be used in all subsequent analyses. Empathy scores fell approximately at the midpoint in comparison to the possible range. With regards to the HNS, the scores were generally high when compared to the possible range.

The open-ended questions on the HNS (regarding how participants went about attaining each need) was analysed using the principles of Thematic Analysis, following Braun and Clark's (2006) six-step guideline. Focusing on the four of the needs that were identified by Taylor (2017) which were deemed pertinent to this study (i.e., *Personal choice and Independence*, *Inner Peace*, *Excellence at Work*, and *Happiness*). The first three were found to be attained in a pro-social manner. However, for *Happiness*, a theme entitled 'Be more selfish' emerged, suggesting that many participants were using non-prosocial means to attain this need (see Appendix 6).

Table 1: Descriptive statistics and internal consistencies for all measures.

Measure	Mean (*SD*)	Possible Range	Cronbach's α
Proclivity Total	54.25 (27.76)	18 to 126	.95
Opportunity Proclivity	27.31 (14.38)	9 to 63	.90
Planned Proclivity	26.94 (13.96)	9 to 63	.90
BCDS	68.18 (33.04)	26-182	.96
Factor 1	43.89 (26.11)	19-133	.97
Factor 2	24.29 (26.12)	7-49	.78
PICTS-L-SF	61.64 (22.10)	34-136	.96
BEM	--	--	.96
Burglary Cognitive Empathy	135.32 (27.08)	30-210	.92
Burglary Affective Empathy	79.21 (20.80)	20-140	.86
General Cognitive Empathy	145.04 (26.00)	30-210	.92
General Affective Empathy	76.21 (20.02)	20-140	.88
HNS	78.31 (18.23)	15-105	.94

Note: BCDS = Burglary Cognitive Distortion Scale, PICTS-L-SF = Psychological Inventory of Criminal Thinking Styles–Layperson–Short Form, BEM = Burglary Empathy Measure, HNS = Human Needs Scale.

Validity and Reliability of the Burglary Cognitive Distortion Scale

Exploratory Factor Analysis

Exploratory factor analysis was conducted using principal axis factor analysis on the 36 items of the BCDS, using Varimax rotation. The Kaiser-Meyer-Olkin measure

verified the sampling adequacy for the analysis, *KMO* = .98. An initial analysis was run to obtain eigenvalues for each potential factor in the data. Three factors had eigenvalues over Kaiser's criterion of 1, and in combination, explained 67.52% of the variance. To ensure the correct factor retention, parallel analysis was used. Parallel analysis involves four stages. The first is the generation of random datasets using the same ranges and number of variables as the real dataset. The second stage is to extract the eigenvalues from 50 randomised datasets. The third step involves averaging the eigenvalues of these randomised datasets. Finally, these eigenvalues are compared against the eigenvalues from the real dataset (Hayton, Allen, & Scarpello, 2004).

The parallel analysis indicated that two factors should be retained, as the third factor's eigenvalue was too low in comparison to the generated eigenvalue. Table 2 shows the factor loadings after rotation. The first factor was found to have 27 items. Due to this high number of items, an attempt was made to reduce the item pool by checking for multi-collinearity. Eight items with a correlation coefficient of 0.8 or above (and which were additionally thematically similar) were removed. For example, Item 6 ("*A person should be able to do whatever they can to get the things they want*"), Item 7 ("*If someone really wants something, they should be able to just take it*"), and Item 1 ("*If someone cannot protect their home from invasion, then someone else has the right to burgle it*") all correlated above 0.8 and described a similar theme. Therefore, Item 6 and 7 were removed while Item 1 remained). In all, this procedure resulted in 19 items being retained for the first factor. In contrast, Factor 2 had only seven items. Factor 1 was termed 'Acquisitive Entitlement', while Factor 2 was termed 'Survive by any Means'. From this point onwards, any mention to the BCDS will be in reference to the final, 26-item version (see Appendix 1).

Table 2: Summary of factor analysis results for the Burglary Cognitive Distortion Scale

	Rotated factor loadings	
Item	Factor 1	Factor 2
7- If someone cannot protect their home from invasion, then someone else has the right to burgle it.	**.92**	
17- Burgling a child's room is fine, as they'll get over it. *	**.89**	
6- If someone really wants something, they should be able to just take it. *	**.89**	
1- A person should be able to do whatever they can to get the things they want. *	**.87**	
12- Most people are not deserving of what they have, so they deserve to be burgled. *	**.86**	
5- I believe burglars are deserving of whatever they can steal if people leave their house vulnerable. *	**.86**	
21- Burglary is a form of justice against those born with a silver spoon.	**.86**	
13- Money is money at the end of the day, it doesn't matter how you get it.	**.85**	
20- Unlike violent or sexual crimes, Burglary is victimless. *	**.85**	
18- People don't care if their stuff is taken, as it is all insured.	**.84**	
23- Manipulating a person just to get into their house and take things is not burglary *	**.83**	
33- Burglary is more fulfilling than work.	**.82**	
2- As long as you don't go too far, it's fine to break the law to get what you deserve.	**.82**	
19- It is fine if I steal from the rich; it makes me like Robin Hood. *	**.82**	
27- If a person can't afford to live, it should be fine to burgle houses to survive.	**.80**	
4- There are those with everything and it needs sharing equally, even if it has to be taken from them.	**.77**	
30- People make such an issue out of the possessions that they lose in a burglary – it's just stuff.	**.72**	
14- Many over-exaggerate the effect that being burgled has on them.	**.70**	
32- Burglars are smart and impossible to catch.	**.70**	
36- Some people are immoral, as so being burgled is karma.	**.68**	
11- Anyone so careless to not properly secure their house is partly to blame for being burgled.	**.65**	
15- People would burgle from you if they had the chance and needed the money.	**.63**	.50
22- When people get burgled, they lie to claim back more that they lost. So, everybody wins.	**.62**	.45
25- The need to burgle builds and eventually bursts out.	**.62**	
29- If the positions were swapped, victims of burglary would resort to burglary to survive.	**.56**	.52
16- If someone is being burgled multiple times, it is probably their fault.	**.56**	.45
31- By having nice things on show in a home, people are inviting burglars in.	**.50**	.45
3- Nowadays jobs pay so little, so an easy way to make money is through burglary.	.53	**.61**
35- Some people are forced to burgle due to the demand our society places on wealth.	.44	**.60**
24- Burglary is a thrill ride, it gives you a rush.		**.54**
28- Some people are not burglars - they are just out of luck and trying to get by.	.43	**.53**
8- The elderly are easy victims of burglary.		**.51**
34- While I can take from those who have many things, kids and the elderly should not to be victimised.		**.45**
9- Burglars will harm you and your family to get what they want; you are just in the way.		**.44**
26- It's alcohol and drugs that causes someone to commit burglary.		
10- Nothing will stop a burglar from getting into your house.		
Eigenvalues	20.74	2.14
% of variance	57.61	5.93

*Note: Emboldened items are the accepted loading for that factor. * - Items removed due to multi-collinearity.*

Convergent validity

Given that the PICT-L-SF is a measure of general offence-related cognitive distortions, the relationship between the BCDS and PICTS-L-SF was assessed in order to test convergence. A Pearson's correlation test showed that the two variables were strongly and significantly related (r = .78, p <.001, N =306). Factor 1 of the BCDS was also found to be strongly and significantly related to the PICTS-L-SF (r = .79, p <.001, N =306), as was Factor 2, but to slightly less strong extent (r = .59, p <.001, N =306). These findings provide support for the BCDS as an assessment of distorted cognitions.

Internal reliability

The Cronbach's alpha was computed for the BCDS total and each of the two factors in order to ensure internal consistency. The BCDS total showed excellent internal reliability (α = .98), as did the first factor (α = .97). The second factor showed a very good level of internal consistency (α = .78). This suggests that the BCDS and its subscale are measuring the same core concept.

Examining the Relationship between Burglary Proclivity and Each Key Variable

Pearson's correlations were run to test the relationship between the BPS total and the other core variables (BCDS, BCDS subscales, PICTS-L-SF, HNS, and each of the BEM subscales; see Table 3). Burglary proclivity and the BCDS were found to be strongly and significantly related (r = .59, p <.001, N = 306). Proclivity and BCDS Factor 1 were also strongly and significantly related (r = .59, p < .001, N = 306). Proclivity and BCDS Factor 2 showed a moderate-high, significant relationship (r = .48, p < .001, N = 306). These results support Hypothesis 1. Proclivity and PICTS-*L*-

SF were also found to be strongly and significantly related ($r = .59$, $p < .001$, $N = 306$), supporting Hypothesis 2.

While proclivity was not associated with Burglary-specific Cognitive Empathy ($r = .07$, $p = .22$, $N = 305$), it was significantly associated with Burglary-specific Affective Empathy, albeit weakly ($r = .14$, $p = .017$, $N = 305$). Similarly, proclivity was not significantly associated with General Cognitive Empathy ($r = -.072$, $p = .21$, $N = 306$), but did show significant (albeit weak) relationship with General Affective Empathy ($r = .17$, $p = .003$, $N = 306$). These results do not support Hypothesis 4, but not Hypothesis 3. Finally, although the relationship between proclivity and HNS was in the expected negative direction, it was not statistically significant ($r = -.08$, $p = .19$, $N = 306$). Thus, Hypothesis 5 was not supported.

Examining the Relationship between Cognitive Distortions and Empathy

The relationship between the PICTS-L-SF and the four empathy subscales of the BEM were assessed using a Pearson's correlation test. The PICTS-L-SF and Burglary-specific Cognitive Empathy were found to be significantly related, albeit weakly ($r = .12$, $p = .03$, $N = 305$). The PICTS-L-SF and Burglary-specific Affective Empathy were found to have a slightly stronger, significant relationship ($r = .23$, $p < .001$, $N = 305$). While the PICTS-L-SF and General Cognitive Empathy were not significantly related ($r = -.003$, $p = .95$, $N = 306$), the PICTS-L-SF and General Affective Empathy showed a weak-moderate significant relationship ($r = .27$, $p < .001$, $N = 306$).

The relationship between the two BCDS factors and the four empathy subscales were assessed using Pearson's correlations. BCDS Factor 1 was significantly, albeit weakly, associated with Burglary-specific Cognitive Empathy (*r*

= .14, p = .012, N =305). The BCDS Factor 1 was also moderately associated with Burglary Affective Empathy (r = .29, p <.001, N =305). BCDS Factor 1 was not significantly related to General Cognitive Empathy (r = - .04, p = .48, N =306) but did show a moderate, significant relationship with General Affective Empathy (r = .32, p <.001, N =306). BCDS Factor 2 showed a weak relationship with both Burglary-specific Cognitive Empathy (r = .24, p < .001, N =305) and Burglary-specific Affective Empathy (r = .22, p < .001, N =305). BCDS Factor 2 was also associated weakly with both General Cognitive Empathy (r = .12, p = .03, N =306) and General Affective Empathy (r = .26, p < .001, N =306).

Table 3: Pearson's correlation coefficients for the independent and dependent variables (N = 306)

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Proclivity Total	1									
2. BCDS F1	.58***	1								
3. BCDS F2	.48***	.72***	1							
4. BCDS Total	.59***	.98***	83***	1						
5. PICTS-L-SF	.59***	.79***	.59***	.78***	1					
6. Burglary Cognitive Empathy	.07	.14*	.24***	.18**	.12*	1				
7. Burglary Affective Empathy	.13*	.29***	.22***	.29***	.23***	.52***	1			
8. General Cognitive Empathy	-.07	-.04	.12**	.001	-.003	.57***	.25***	1		
9. General Affective Empathy	.17***	.32***	.26***	.32***	.27***	.49***	.70***	.36***	1	
10. HNS	-.07	-.06	-.06	-.06	-17**	-.05	.007	-.05	.05	1

Note: *BCDS = Burglary Cognitive Distortion Scale, PICTS-L-SF = Psychological Inventory of Criminal Thinking Styles–Layperson–Short Form, HNS = Human Needs Scale.* * p = .05, ** = p = .01, *** p = .001

Regression Analysis

To test which of the established correlates (i.e., BCDS Factor 1, BCDS Factor 2, PICTS-L-SF, Burglary Affective Empathy, and General Affective Empathy) statistically predict Burglary Proclivity, a direct multiple regression was run (Hypothesis 6). First, each assumption for multiple regression analyses were checked. Analysis of standard residuals was conducted to identify outliers, which found that two participants needed to be removed. Analysis was conducted again and revealed no outliers (*Std. Residual Min* = -3.00, *Std. Residual Max* =2.83). The assumption of

collinearity highlighted that multi-collinearity was not a concern (PICTS-L-SF Tolerance = .35, VIF = 2.90; BCDS Factor 1 Tolerance = .27, VIF = 3.75; BCDS Factor 2 Tolerance = .48, VIF = 2.09; Burglary Affective Empathy Tolerance = .52, VIF = 1.94; General Affective Empathy Tolerance = .50, VIF = 2.00). The dataset also met the assumption of independent residuals (*Durbin-Watson* = 1.91). The assumption of normally distributed residuals was checked using a histogram and P-P plot of standardised residuals and indicated normally distributed errors (see Figure 1). The scatterplots of standardised residuals showed signs of funnelling, meaning that the assumption of homoscedasticity had not been met but linearity had (see Figure 1). The assumption of non-zero variances was also met (PICTS-L-SF Variance = 478.83; BCDS Factor 1 Variance = 684.85; BCDS Factor 2 Variance = 78.09; Burglary Affective Empathy Variance = 430.61; General Affective Empathy Variance = 400.18; Proclivity Variance = 741.41). Based on these checks, a multiple regression was deemed appropriate to use.

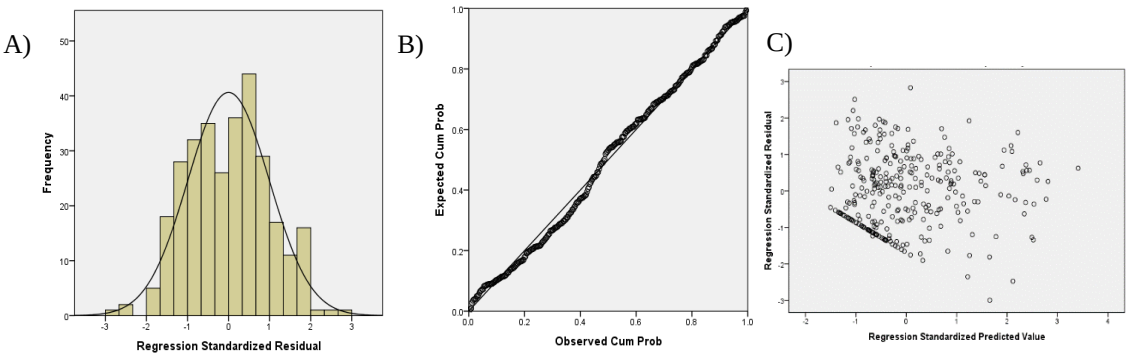

Figure 1*: A) Histogram highlighting the normal distribution of data over a bar chart of the studies data. B) P-P plot showing the normal distribution of data with little deviation. C) Scatterplot of Standardised residuals showing heteroscedasticity.*

The regression model, which was found to be significant, (F (5, 297) = 40.58, p < .001), produced an R-squared of .41 and an adjusted R-squared of .40. Thus, 40% of the variance in Proclivity was explained by the entered variables. Looking at the individual variables, the PICTS-L-SF was found to be a significant predictor of

Proclivity, $\beta = .31$, t (297) = 4.06, $p < .001$. Factor 1 of the BCDS was also a significant predictor, $\beta = .25$, t (297) = 2.87, $p = .004$. BCDS Factor 2 was a significant predictor of Proclivity $\beta = .16$, t (297) = 2.48, $p = .014$. Burglary Affective Empathy did not significantly predict proclivity $\beta = -.028$, t (297) = -.44, $p = .66$, nor did General Affective Empathy, $\beta = -.029$, t (297) = -.45, $p = .65$. These results provide partial support Hypothesis 6.

Exploratory Mediation Analyses

Three mediation analyses were run using the PROCESS macro (Hayes, 2018) to investigate whether PICTS-L-SF mediated the relationship between of BCDS Factor 1, BCDS Factor 2, and BCDS on Proclivity scores (see Figure 2). It was expected that due to diverse offending history typically seen in burglars that PICTS-L-SF would have a mediating effect between burglary-specific distorted cognitions and burglary proclivity.

The results showed that for the direct effect of BCDS Factor 1 on Proclivity was significant, as was the indirect effect using PICTS-L-SF as a mediator, finding the bootstrapped confidence intervals had not crossed 0 (see Figure 2A; Hayes, 2018). Similarly, both the direct and indirect effect for BCDS Factors 2 on proclivity with PICTS-L-SF as a mediator was also significant (see Figure 2B). Finally, the same can be said for the BCDS total on Proclivity when mediating for PICTS-L-SF finding significant direct and indirect effect (see Figure 2C). Notably in the second model (see Figure 2B) the beta coefficient was higher for the indirect effect in comparison to the

direct effect whereas this was not the case for the other models. The total effect of the model.

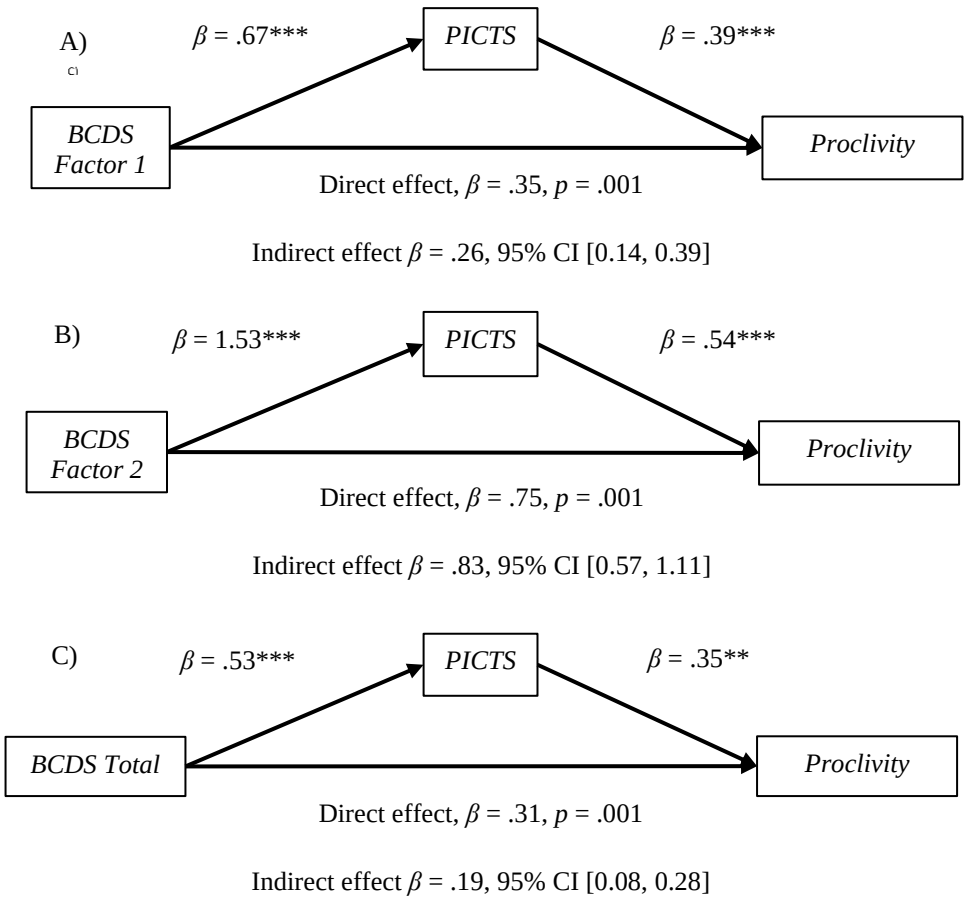

Figure 2: *Meditation analysis diagrams for A) the direct and indirect effect between BCDS Factor 1 and Proclivity, meditated by PICTS. B) The direct and indirect effect between BCDS Factor 2 and Proclivity meditated by PICTS. C) The direct and indirect effect between BCDS and Proclivity meditated by PICTS.* ** = p = .002, *** = $p < .001$

Discussion

The main aim of this study was to identify the cognitive factors that are linked to the proclivity to burgle in non-offending sample. In support of Hypothesis 1 and 2, the results revealed an association between burglary proclivity and both burglary-related and general offence-related cognitive distortions. Hypothesis 4 was not supported, as low affective empathy (both burglary-specific and general) was negatively correlated with proclivity. Nor was, Hypothesis 3 supported, as burglary proclivity was not

associated with either burglary-specific or general cognitive empathy. Hypothesis 5 stated that those low on human needs acquisition would score higher on burglary proclivity. However, this was not supported. Finally, in line with previous literature, it was hypothesised that the factors would predict a significant amount of variance, partial support was found for hypothesis 6 finding that only both types of cognitive distortions were significant.

The results support both Hypothesis 1 and 2, as a strong positive correlation was found between burglary proclivity and both burglary-related and general cognitive distortions. Thus, as offence-related beliefs increase then so does the proclivity to burgle. This falls in line with previous research that has found a positive association between cognitive distortions and other forms of offending proclivity, such as fire setting (Gannon & Barrowcliffe, 2012). In addition, the present study found that both Factor 1 and 2 of the BCDS strongly correlated with the proclivity to burgle, with Factor 1 showing the stronger relationship. This suggests that 'Acquisitive Entitlement' is more closely linked than beliefs about finding any means to survive. Therefore, it can be suggested that it is important to focus upon distorted beliefs when attempting to prevent at-risk individuals from committing a burglary offence.

The results of the multiple regression provided partial support for Hypothesis 6, as distorted beliefs (both general and burglary-related) were significant predictors of burglary proclivity, particularly general criminal distortions. It was found that Affective empathy (global or burglary-specific) was not significantly predicting variance on burglary proclivity. These results highlight how there is more to be understood regarding the proclivity to commit a burglary offence, and that is more complex than originally thought. General criminality also predicting variance on burglary proclivity shows the interconnectedness of burglary and general criminality.

It has been found that many offenders have a diverse history of offending that are in some way linked to their burglary offences. (Vaughn, DeLisi, Beaver, & Howard, 2008). Beyond this it cannot be stated why that general criminality has predicted burglary proclivity so strongly, however it could be due to the similar in themes between general offending and burglary offences such as entitlement, or other criminogenic factors.

There was no significant correlate found between cognitive empathy and the proclivity to burgle. These results suggest that there is no link between perspective taking and the proclivity to burgle. A weak positive correlation was also found between the proclivity to commit burglary and general and burglary-specific affective empathy. These results suggest that, as affective empathy increases, so too does burglary proclivity, which is contrary to what was hypothesised. This could be due to the sample (of non-offenders) having a high empathic concern, which could affect their proclivity to burgle. However, the regression analysis revealed that proclivity was not significantly predicted by either of the two affective empathy subscales. It is clear that empathy needs to be further explored in regard to burglary in order to highlight whether those who have committed burglary have the ability to recognise the effects of their offending on the victims.

Given that both forms of cognitive distortions showed strong relationships to burglary proclivity, mediation analyses were conducted to explore whether general distortions mediated the link between burglary-related distortions and proclivity. It was found that the PICTS-L-SF mediated the link between BCDS and proclivity, as the link between the two BCDS subscales and Proclivity. It was found for BCDS total and BCDS Factor 1 the relationship was better explained through the direct effect rather than the indirect effect. Whilst for BCDS Factor 2 it was found that the indirect

effect better explained the relationship in comparison to the direct effect. These results highlight that the BCDS Factor 2 is better explained through a mediating process with PICTS-L-SF on proclivity than the direct effect. This shows the prominence of the BCDS factors, as Factor 1 is more generalisable to general offending in comparison to Factor 2. These results support Taylor's (2017) work of rehabilitation in burglary offenders finding a reduction, not only in burglary recidivism, but also general recidivism. The mediation analyses have suggested that burglary cognitive distortions are for the most part are causal in general offending cognitions on burglary proclivity. Therefore, this highlights how burglary has similarities with general offending and could explain why some burglars have a diverse criminal history.

With regards to empathy, it was found that both forms of affective empathy, and burglary cognitive empathy weakly and moderately correlated, with Factor 1 of the BCDS, as well as the PICTS-L-SF. All four empathy subscales weakly correlated with Factor 2 of the BCDS. This supports previous findings in other offender groups who showed high cognitive empathy and high levels of cognitive distortions (Marshall et al., 2001). Marshall et al. (2001) also found that affective empathy positively correlated with distorted cognition, with no reason as to why. In the present study, these findings could be due to the sample being non-offenders and, therefore, feeling more empathetic concern for their theoretical actions.

A secondary aim of this research was to make a new measure to assess burglary-specific cognitive distortions. The PICTS-L-SF was used to test convergent validity, finding a strong correlation between the two measures, highlighting the potential for similar constructs. The BCDS was built upon existing research on burglary, and therefore needed to be refined to reduce any thematically similar items. Factor 1 consisted of a larger number of items (n = 27). However, eight items were

removed based on their very high correlation coefficients (*r*'s above 0.8), and thematic similarity. Thus, Factor 1 was reduced to 19 items and was deemed to reflect 'Acquisitive Entitlement' (as there was a strong theme around having the right to take whatever they can and want). Factor 2 contained seven items and was labelled 'Survive by any Means' based on the nature of the items. The two items were disregarded from the scale, as they failed to load on either factor.

Overall these findings have highlighted that there are factors which affect the proclivity to burgle. This study has made a theoretical advancement in the knowledge around burglary providing a chance to further increase the literature. Additionally, it has shown that the proclivity to burgle is complex and due to this, the rehabilitation of burglars' cognition is likely to also be complex.

Limitations

A possible limitation of this research is the use of a monetarily compensated sample. There has been criticism around the use of the sample type over the more traditional use of university students. Goodman, Cryder, and Cheema (2013) found that, when comparing college students against an MTurk sample, there were similarities and differences. Specifically, MTurk participants paid less attention to experimental materials and used internet-sourced answers, but were also more reliable regarding decision-making, and were more attentive to manipulation (Goodman et al., 2013; Hauser & Schwarz, 2016). This suggests that, when using an MTurk sample, certain aspects need to be considered. For this study, it could be that the sample did lack attention to the vignettes in the BPS. If so, it could be argued why the proclivity to offend was so low. However, it has been found that MTurk provides a more

representative sample of the general population in comparison to using students or distributing studies through social media. This suggests that the present study used a more representative sample of the general population than if participants had been gathered through more traditional means (Casler, Bickel, & Hackett 2013).

One aspect of this study was the development and validation of a new scale designed to measure burglary-related cognitions. The BCDS was made via a thorough literature review using qualitative research papers, case reports, and research looking into motivational factors. To increase the validity of the BCDS, the distortions could have been gathered from burglary offenders directly, thus ensuring that they are cognitive distortions held by burglars. Yet, the measure has shown strong psychometric properties and convergent validity, does however require validation against a sample of offenders.

The results highlighted a low proclivity to burgle. To ensure that the results were not a response bias, the Social Desirability Scale (Crowne, & Marlowe, 1960) could have been used. This measure, and others similar, have been shown to correlate with scales that assess anti-social factors, such as anger scales with those on parole (Fernandez, Kiageri, Guharajan, & Day, 2018), hostility, sexual interest, and social inadequacy in sexual offenders against children (Stevens, Tan, & Grace, 2016). This measure would have ensured that participants' answers were not influenced by a bias to seem more socially desirable.

Future Research

The findings of this research highlight some of the cognitive factors that influence someone to commit burglary. As such, they contribute to understanding of burglary,

which can be used to build a unified theory. Thus, the next step is to corroborate the present findings using another non-offender sample as well as a sample of convicted burglars. More research must also be conducted examining other factors associated with burglary, as well as the offence motivations.

The findings from this research can also guide future research that aims to investigate the relationship between burglary-related biases (e.g. via eye-tracking) and behaviours (e.g. via virtual reality (VR)). Future research can highlight the link between these cognitions and the current theory of expertise, potentially to provide insight into how the cognitions held by a burglar can affect their offending behaviours. Whether those who have more burglary-related cognitions (e.g. higher in burglary cognitive distortions) will have distinct differences in how they offend in comparison to someone who does not, it could suggest that cognitive distortions allow for justifications to make immoral decisions rather than being post-hoc. This could be done by using a sample of non-offenders and looking for differences in offending patterns that correlate with the cognitions or by using different experienced burglars (non-offenders to lifelong offenders) and examining the differences between their offending patterns the correlations with the distorted cognitions. Furthermore, by using sophisticated technology like VR headsets with eye-tracking capabilities could also provide insight into the differences between non-burglars and burglars regarding search autonomy. This could highlight fixations and scanning methods as the burglar explores the house. This also has the potential to highlight how one's belief structures effect a criminal offence.

Finally, the newly created measures may be of use to others in the field. For example, the BCDS, which is the first measure of its kind in the burglary literature, offers the capability for researchers to investigate the beliefs of burglars and burglary-

prone individuals. It may also be of use and in forensic settings, as it could provide practitioners with the means to measure burglary-related cognitive distortions, which may be useful when devising case formulations and considering appropriate courses of intervention. Of course, more research is required to further validate the measure, especially in convicted samples. A key goal would be to determine the ability of the BCDS to predict the risk of recidivism. Similarly, the BPS can be used by researchers and practitioners to address proneness to commit burglary. The measure has also suggested the ability to highlight the causal factors linked to burglary proclivity, allowing for further research similar to this study to uncover other related factors. Furthermore, more research is required to validate this measure against a sample of burglars, and to investigate the differences between the two types of proclivity; planned and opportunistic.

Conclusion

This study has highlighted the complexity of the cognitive factors linked to the proclivity to burgle. Yet, whilst the BCDS has not been tested against a sample of burglary offenders, the study provides initial evidence for focusing on burglary-specific cognitive distortions when attempting to understand burglary. Most interestingly, this research has shown that the link between burglary-specific cognitive distortions and burglary proclivity is mediated by general criminal cognitive distortions, suggesting that both forms of distortions are important for understanding burglary. However, while this study has provided some interesting and promising insights, more research is needed to fully unpack the findings. Also, the new measures have proved to be valid and useful, but also require further validation. Doing so, will

provide researchers and forensic practitioners with a means to gain insight into the mind-set of burglary offenders and those prone to burglary.

3

Exploring Burglary Behaviours Using Immersive Virtual Reality

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Abstract

This study investigated into a simulated virtual burglary offence, exploring the associations between offence behaviours and burglary related factors. Additionally, emotional reactivity was explored as well as confounding variables related to Virtual Reality (VR). The study used a mixed design, with the cognitive/affective variables serving as the independent variables, and the simulated burglary behaviours as the dependent variables. The study asked participants to complete four measures, the Burglary Proclivity Scale (BPS), the Burglary Cognitive Distortion Scale (BCDS), the Burglary Empathy Measure (BEM), and the Emotional Reactivity Scale (ERS). Participants were then given a scenario that explained they only had five minutes to simulate a burglary in VR. Then participants were asked to complete three more questionnaires; the Immersive Tendencies Questionnaire, the NASA Task Load Index, and the IGroup Presence Questionnaire. Finally, participants were asked to undergo a semi-structured interview. For this thesis only the quantitative data is reported. This study found that the number of items taken during the simulated burglary was significantly associated to Factor 2 of the BCDS, and Cognitive empathy. For the time taken it was found that previous VR use and age was positively significantly associated. The value of items taken, and the preference for what floor items were taken from were not significantly associated to any variable. The weight of items was found to be significantly associated to Affective empathy, and knowledge in forensic topics. These findings highlight how the strength of an offence-related belief can influence offence behaviours. These findings could help guide preventative, rehabilitative, and assessment work highlighting the beliefs behind their offence behaviours.

Introduction

A predominant view in the burglary literature centres on the idea that burglars are experts in their domain of offending (Nee & Meenaghan, 2006). This is defined by their specialised capability to offend, as well as their automatic decision-making strategies. These include specific routes taken in a house, a focus on particular items, and a focus upon their detection, such as listening out for any interruptions. This 'expertise theory' suggests that repeated offending makes a burglar more proficient at burglary, as they learn and refine their offence script, becoming more specialised in their own pattern of offending. Research has highlighted burglars' ability to identify the 'best' houses to target (Garcia-Retamero & Dhami, 2009; Nee & Taylor, 2000; Snook, Dhami & Kavanagh, 2011). That is, they tend to prefer houses further from main roads, with more cover, and less security, as they have less potential to been seen. Nee (2015) states that previous research has been focussed upon rational, or situational, choice, which led to a focus on changing the environment to prevent burglary. The expertise theory aims to provide a better understanding of what a burglar does leading up to the offence, during the offence, and after the offence. Furthermore, this theory aims to then influence social control models that target criminogenic environments to reduce the chance of an individual becoming a criminal (Nee 2015). Nee (2015) suggests that there are three aspects of crime that the theory can help address: namely, those at risk (particularly the young), those who are offending, and the environmental factors that allow for the opportunity to offend. Contrastingly, Clare (2011) found that expert burglars were less likely to be discouraged by harder targets.

There are issues with the theory and its application to help in the rehabilitation of burglars and prevention of burglary. Whilst the theory does provide insight in how to prevent burglary by reducing the opportunity to offend it does not, provide insight

into why the offender is offending, or any of the needs that are being fulfilled through their criminality. The present study aims to provide the basis for a new perspective in burglary. This perspective will focus more on the factors related to a burglary offence (such as burglary related cognitive distortions, empathy, and emotional reactivity) and how they may influence specific burglary behaviours, including those thought to be evidence of expertise.

Use of Virtual Reality in Burglary

Virtual Reality (VR) is a sophisticated new technology that has provided an opportunity to have participants engage in scenarios previously deemed impossible. VR offers a highly immersive experience where the participant can interact with the virtual environment in line with the programme's capabilities (Seibert & Shafer, 2018). VR has been applied in many different manners within psychology, including therapeutic interventions and experimental research designs (e.g. Rauch et al., 2018; Renaud et al., 2013). VR mitigates ethical concerns around physical harm to the participant (or third party), allowing researchers to address research questions with more ecological validity via the use of realistic virtual environments.

VR has been previously used to simulate burglary offences. Nee et al., (2015) used a laptop to replicate a burglary offence to investigate the differences between two groups of ex-offenders and non-offenders across two conditions; a forensic mock house and a virtual version of the same house. There was no significant difference between the two conditions highlighting that VR is an acceptable replacement for the use of a mock house. This suggests that VR can be used to investigate psychological phenomena in a manner that was previously more difficult. van Gelder et al. (2017)

conducted a similar study using an Oculus Rift Headset and a video-game console controller measuring psycho-physiological stress. Using heart rate monitoring data, there was no difference between baseline scores and scores obtained when the participant was introduced to VR. Yet, there was a difference between the introduction to VR and starting the burglary. This highlights that a simulated burglary offence can elicit a heightened state of arousal that it is not explained by the effect of the VR methodology. This further strengthens the conclusion that VR is valid replica of a burglary offence.

More recently, Meenaghan et al., (2018) employed the same methodology as van Gelder et al. (2017) using a sample of prisoners, asking them to think aloud as they simulated a burglary offence. This method allowed these offenders to relive their offending providing insight a burglar's thought process as they offend. The study was conducted using a laptop and either a keyboard and mouse or a video-game console controller. Thinking aloud gave novel information, as prisoners were able to vocalise their thoughts as they offended (e.g. locations to target, house choice, types of items to steal and who from). The study was able to highlight the type of items that a burglar searches for when burglarising a house. Specifically, lighter items that are easily removable (e.g. jewellery, gold, passports, credit/debit cards) opposed to heavy and large items such as televisions. It was also revealed if the burglars had a planned route for searching the house. It was found that multiple offenders found issue with burglarising the child's bedroom. Suggesting a moral issue that it was wrong to take from a child's bedroom due to wish not to victimise a child. This study aims to provide insight into whether empathy is associated to burglary behaviours in those simulating a first-time burglary offence. The aim of this present study is to develop a

understanding of the relationship between measured empathy and simulated offence behaviours.

Finally, Nee et al. (2019) investigated the differences in burglary behaviours between expert burglars, other offenders, and non-offenders. It was found that other offenders only differed from non-offenders with regards to time taken to burgle but did not differ from expert burglars. Expert burglars took (1) less items, (2) lower amount of weight, (3) lower amount of volume, (4) less mid-value items, and (5) less low value items. However, whilst these differences were significant, they showed very small effect sizes (Hill, Bloom, Black, & Lipsey, 2008). Additionally, there was no significant difference found for more key behaviours such as time spent overall, and the number of small but high value items. Overall, these results show there is very little difference between the 'expert' burglars, other offenders, and non-offenders, which arguably does not provide support for the idea of burglar expertise.

Burglary-Related Cognitions

It has been found that burglary-related cognitive distortions, general cognitive distortions, and both burglary-specific and general affective empathy are all positively associated with the proclivity to burgle in a sample of non-offenders (see Chapter 2). The current study aims to extend these findings by examining whether burglary-related cognitions are correlated with overt burglary-related behaviour. These distortions serve to counter personal beliefs, therefore justifying the offence behaviours. This would suggest that if there is any decision to be made regarding an emotionally negative stimuli that challenges personal beliefs around their actions, that situational

cognitive distortions will have already justified the outcome of this decision (e.g. the justification of taking from a child's bedroom).

With regards to empathy, it can be argued that those low in empathy should be more callous when offending (e.g. taking from a child's bedroom, taking items of sentimental value). This hypothesis is drawn from previous (albeit limited) literature that has examined the role of empathy in burglary. It is commonly thought that 'empathic concern' is driving the inhibitory actions in a burglary offence. For instance, it has been suggested that one of the largest factors is the presence of children within the home (Meenaghan et al., 2018; Roth 2018). Burglary is already an immoral action, yet offenders seem to be able to justify a regular offence, whilst these additional factors cause the offender to believe their actions would be immoral. However, by burglarising an occupied property, offenders would have to potentially confront the occupants, which poses danger to the offender. This provides the opportunity for more loot due to the occupancy, as the occupants personal items that are typically on them will be in the home. Typically, these types of offences are regarded as 'creeper' and are committed by few offenders (Meenaghan et al., 2018), due to the increased chances of danger.

Proclivity is a common concept used in forensic psychology to test the inclination of an individual to commit a certain action. However, it has not yet been investigated whether this influences how an individual will commit the offence. It can be surmised that, if an individual is more prone to burglary, certain aspects of the burglary will alter how they would commit an offence. For instance, if an individual thought that burglary would be exciting, then it stands that when they simulate a burglary offence, they may complete the offence is quick manner, and feel aroused during the simulation. However, if the individual found the offence fulfilling, they may

burgle the home in a manner that maximises the gain from the burglary, thereby, maximising the sense of fulfilment. Therefore, this research aims to explore whether proclivity is associated to the burglary behaviours simulated during a virtual burglary.

Emotional Reactivity and Inhibition

Emotional reactivity is being investigated due to a heavy influx of emotional stimuli during the virtual burglary. The simulation house is designed to replicate a real home, and does have distinct features such as family pictures, and children's bedrooms, and thus should induce an emotional response. Emotional reactivity is typically researched in adolescence and is linked to poor decision making (Hare et al., 2008). It has been found that inhibitory control is negatively associated with emotional reactivity. This is suggested to explain, in part, how behavioural problems arise and continue (Nock, Wedig, Holmberg, & Hooley, 2008). Emotional reactivity and inhibitory control might help people bypass instances that are normally emotionally aversive. Inhibitory control is the mechanism in which impulsive actions and inappropriate strategies are reduced (Schachar, & Logan, 1990). In the case of this current study, it is predicted that participants' emotional reactivity will affect the actions they perform in the simulated burglary offence. It is surmised that those with high emotional reactivity will take less time in the house due arousal and therefore be more impulsive and prone to risky actions during the simulated offence.

Typologies

A typology is defined as a system of classifying or grouping cases based on certain distinguishing features typically during an offence (Koops, Leenes, Meints, Meulen,

& Jaquet-Chiffelle, 2009). Typologies allow for the profiling of an offender (e.g. sex, age, relationship to victim) through the analysis of key behaviours elicited at a crime scene. Typologies are used extensively for high-impact crimes, like rape, homicide, and serial murder (Fox & Farrington, 2018), and are comprised of several 'profiles' within each typology. Regarding burglary, there are three typologies each with four profiles: (1) Merry and Harsent's (2000) typology has four profiles (Intruders, Pilferers, Raiders, and Invaders) and focuses on the interactions between the offender and property (i.e. what items were taken, how they entered the property, and whether they vandalised the property) during the offence. (2) Santtila, Ritvaven, and Mokros' (2004) predominantly focuses upon the property types and the offender characteristics most linked to that type of property, as this simulation only has one house to burgle this typology will not be used. (3) Fox and Farrington's (2012) typology has four profiles (organised, disorganised, opportunistic, and interpersonal) each profile is defined by a series of offence behaviours and was found to increase burglary arrest rates in comparison to cities not using the typology (Fox, & Farrington, 2018). A comparison can be made between Fox and Farrington's (2012) and Merry and Harsent's (2000) typologies and their effectiveness at categorising participants as they commit a simulated first-time burglary. Burglary typologies are dated and under-researched. Therefore, this research may provide a new way to investigate burglary typologies via the simulation of an offence in VR. This study then aims to explore whether these typologies emerge in a non-offending sample during a simulated burglary and, if so, whether they are associated with cognitions related to burglary. By understanding if there is an association between typologies and cognitive factors, efforts could be made to better understand the drives for this form of offending, which can have implications for prevention, rehabilitation, and assessment.

The Present Study

It is hypothesised, that the overall number of items taken would be positively associated to proclivity, burglary cognitive distortions, and empathy (Hypothesis 1) whilst showing a negative association to emotional reactivity (Hypothesis 2). Similarly, that time taken in the simulated burglary would be negatively associated with emotional reactivity (Hypothesis 3), whilst being positively associated with Immersion, and empathy (Hypothesis 4). Proclivity, burglary cognitive distortions, and empathy would be positively associated with the preference of high value items (Hypothesis 5), but negatively associated with the preference of high weight items (Hypothesis 6). That burglary cognitive distortions would be positively associated with the preference for items on the first floor (Hypothesis 7), whilst emotional reactivity would be negatively associated (Hypothesis 8). If a significant association is found, then regression analysis will be conducted to further explore these relationships. Finally, that there would be significant effects of burglary cognitions (proclivity, cognitive distortions, and empathy) on profiles of typologies (Hypothesis 9).

Methodology

Participants

The study involved a sample of 52 participants aged between 18 and 70 years of age (M = 27.1, SD = 12). The sample consisted of 22 self-identified males and 30 self-identified females. The majority of the sample self-identified as White (78.8%), with the remainder identifying as ‘Other’ (22.2%). Thirty-three participants had used a VR headset before. To check for prior knowledge of burglary, participants were asked if

they had been burgled before. Of the 52 participants, 38 had not been burgled, whereas 14 had been a victim. None of the sample claimed to have committed an offence, and three worked or studied in forensic psychology or science. The exclusion criteria were any individual under the age of 18 and anyone with a medical condition that would be adversely affected by VR. Participants were recruited via social media, email invitation, and the University of Lincoln's SONA participant response system. Recruitment posters were placed around the University campus.

Design

This study used a mixed-methods design. The quantitative aspects adopt a within-subjects, cross-sectional design, and the qualitative component was comprised of a within-subjects interview. The cognitive factors (i.e., cognitive distortions, empathy), along with proclivity and emotional reactivity scores were the independent variables, while participants' mock-burglary behaviour (i.e., route, time taken, number of items removed) were the dependent variables.

Materials

An HTC VIVE VR headset was used, this consisted of a head mounted display (HMD) with in-built headphones, two motion-controllers, and two base stations that tracked movement. The virtual burglary simulation was developed in Unity by Computer Science researchers at the University of Hull and the University of Lincoln. The virtual house was a two-storey home with 3-bedrooms (see figure 3) and contained 45 items that could be stolen. The choice of the items were guided, in part, by the findings of the CRAVED model (Clarke, & Webb, 1999). The CRAVED model listed the most

frequently taken items from a domestic burglary. However, due to the model being rather dated (e.g., including video tapes as an item), updates to the current list were required (e.g., including more modern forms of technology, such as Smartphones, tablets, and laptops). Participants could carry a maximum of 10 items to simulate what could fit in their pockets as well as what would fit in a bag. When taken, the item disappeared and left a green highlighted border. This allowed for the item to be returned to its original place if desired. The doors, cupboards, and windows around the house were all able to be opened and closed, allowing participants to fully interact with the house. Similarly, lights within the house could be turned on and off. To move around the house, participants could use a combination of walking and teleporting (within visual sightlines).

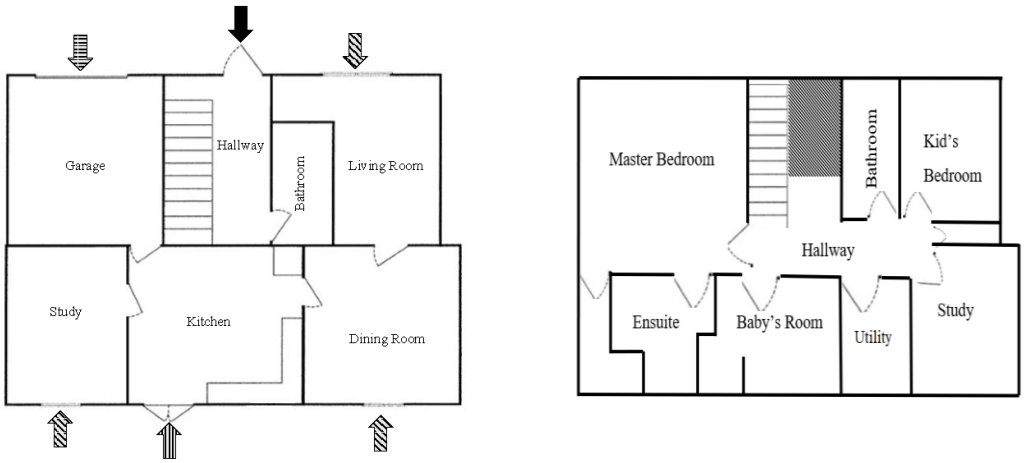

Figure 3: The ground floor floorplan, which potential method of ingress, horizontal pattern shows entry through a garage door, the black arrow shows the entry through the front door, the vertical pattern shows entry through the rear door, and the diagonal pattern arrows show entry through a windows. And the first-floor floorplan.

Psychological Measures (each measure can be found in the Appendix).

Burglary Proclivity Scale (BPS): A set of newly developed vignettes (see Chapter 2) were used to assess participants' inclination to commit burglary. The measure contained six vignettes. Three of the vignettes described opportunistic burglary

offences, whilst the other three described planned burglary offences. After each vignette, a set of questions were completed that assessed participants' level of excitement, fulfilment, and behavioural propensity to do the same. These questions were scored on a 7-point Likert scale ranging from 'Very Unlikely' (1) to 'Very Likely' (7). A score of above 1 showed a proclivity to burgle as it is not an absolute rejection. The overall score on the BPS was found to have high internal consistency (see Table 4).

Burglary Cognitive Distortions Scale (BCDS; see Chapter 2): This scale measured distorted beliefs related to burglary. The measure consisted of 26 items and was scored on a 7-point Likert scale ranging from strongly disagree to strongly agree. The measure had two factors, (1) 'Acquisitive Entitlement' containing 19 items. (2) 'Survive by any Means' which contained 7 items. Factor 1 had a good internal consistency, while Factor 2 had a low but acceptable internal consistency. Overall, the BCDS had a very good level of internal consistency (see Table 4).

Burglary Empathy Measure (BEM; see Chapter 2): This study uses an altered version of the BEM which does not include general empathy. This scale was designed to assess burglary-specific empathy. The measure had two subscales: Cognitive Empathy (30 items), and Affective Empathy (20 items). A burglary scenario was described, which involves a person finding their house has been burgled. The participant responded as though they were the perpetrator. The measure was scored on a 7-point Likert scale from extremely unlikely to extremely likely. High scores on this measure indicated high levels of empathy. Overall, the BEM had a very good internal consistency. The

cognitive subscale showed a very good internal consistency, whilst the affective subscale showed an acceptable alpha (see Table 4).

Emotional Reactivity Scale (ERS; Nock, Wedig, Holmberg, & Hooley, 2008): This measure assessed participants' emotional reactivity. It consisted of 21 items, scored on a 5-point Likert scale (Not like me at all – Completely like me). There were three subscales; Sensitivity (10 items), Arousal/Intensity (7 items), and Persistence (4 items). Cronbach's alpha for this measure was excellent for each of the measures bar the 'Persistence' subscale, which was in the acceptable range (see Table 4).

Screening: This measure was used to identify those who had any pre-existing conditions that could be affected and/or worsened by using VR. If this was the case, then the participant was kindly removed from the study and advised to not use VR.

Immersive Tendencies Questionnaire (ITQ; Witmer, & Singer, 1998): This measure consisted of 29 items that assessed the tendency to become immersed in an activity. The measure had three foci; (1) the tendency to become focused on an activity and maintain it; (2) the tendency to become involved in an activity and maintain it, and (3) the tendency to play video games. All these items were measured on a 7-point scale. The ITQ was found to have questionable internal consistency in this study (see Table 4).

NASA-Task Load Index (NASA-TLX; Hart & Staveland, 1988): This measure was comprised of six items measuring the attentive demand placed upon participants by

the research task. Each item was assessed using a 10-point Likert scale (Low to High). The measure was found to have an acceptable internal consistency (see Table 4).

Igroup Presence Questionnaire (IPQ): This measure consisted of 14 items scored on a 7-point Likert scale. It was made of up of four subscales: General Presence (1 item), Spatial Presence (4 items), Involvement (4 items), and Experienced Realism (4 items). This measure evaluated how immersed the participant was in the VR task. The measure was made from a collection of sources by the Igroup (Carlin, Hoffman, & Weghorst, 1997; Hendrix, 1994; Igroup 2016; Slater, & Usoh, 1993; Witmer, & Singer, 1994). This measure was found to have an overall questionable cronbach's alpha (see Table 4).

Semi-structured interview: This interview was comprised a set of 10 open questions to uncover the reasons underlying participants' actions committed during the mock-burglary. This interview lasted no longer than 10 minutes.

Procedure

Participants were asked to fill out a screening measure, then asked formally to provide their consent. Participants were then be asked to state basic demographic information, before completing the Burglary Cognitive Distortion Scale, Burglary Empathy Measure, Burglary Proclivity Scale, and Emotional Reactivity Scale in a randomised order. These measures were completed in the lab via Qualtrics.

Participants were asked to complete a practice task to get accustomed with VR and the mechanics of the task. If the participant agreed to carry on and felt no discomfort, they

were given a scenario to read (Appendix 13) that provided a context to the simulated burglary. This scenario suggested that they only had five minutes to burgle the property. Participants were placed back into VR and were asked to burgle the simulated house. The simulation was recorded via camera (as recording via the software led to a decrease in processing power and, in turn, a decreased framerate on the head mounted display, therefore decreasing immersion). Participants were not informed of the running time and were left to continue if the limit was passed. To finish, participants had to leave the property and vocalise their completion. Once participants had finished, they were taken out of VR and asked to complete the Immersive Tendencies Questionnaire, the NASA-Task Load Index, and the Immersive Presence Questionnaire. Finally, participants took part in a semi-structured interview that inquired about the actions they made during the mock-burglary. Participants were then debriefed and thanked.

Results

For the purpose of this thesis the results shall focus on the quantitative data.

Descriptive statistics

The scores for each measure and their subscales can be found in Table 4. Scores on the proclivity scale, BCDS, and Factor 1 of the BCDS were low, whereas, for Factor 2 of the BCDS were at the midpoint (when compared to the possible range). Cognitive empathy was scored in the mid to high area of the possible range, whilst affective empathy was score mid to low. Emotional reactivity and its subscales were all scored in the lower range. The ITQ and NASA-TXL fell in the midpoint in comparison to the

Table 4: Descriptive statistics and internal consistencies for all measures.

Measure	Mean (*SD*)	Possible Range	Cronbach's α
Proclivity	49.92 (19.75)	18 - 126	.91
BCDS	63.52 (14.21)	26-182	.80
Factor 1 – 'Acquisitive Entitlement'	37.39 (9.19)	19-133	.77
Factor 2 – 'Survive by any means'	25.35 (6.42)	7-49	.60
BEM	--	--	.83
Burglary Cognitive Empathy	142.16 (16.70)	30-210	.88
Burglary Affective Empathy	78.75 (13.96)	20-140	.71
ERS	55.78 (18.07)	21-105	.94
Sensitivity	26.08 (9.36)	10-50	.90
Persistence	10.63 (3.98)	4-20	.72
Arousal/Intensity	19.08 (6.87)	7-35	.91
ITQ	113.31 (13.72)	29-203	.60
NASA-TXL	30.67 (7.89)	6-60	.68
IPQ	62.63 (6.31)	14-98	.61
General Presence	5.69 (1.16)	1-7	--
Spatial Presence	24.98 (3.56)	5-35	.50
Involvement	18.43 (2.93)	4-28	.77
Experienced Realism	13.52 (2.89)	4-28	.22

Note: BCDS = Burglary Cognitive Distortion Scale, BEM = Burglary Empathy Measure, ERS = Emotional Reactivity Scale, ITQ = Immersive Tendencies Questionnaire, NASA-TXL = NASA Task load Index, IPQ = Immersive Presence Questionnaire.

possible range. Finally, the IPQ scores were high similar as were its subscales, bar 'Experienced realism', which was around the midpoint.

Burglary Behaviours

Table 5 shows the descriptive statistics for the behaviours of interest that occurred during the simulated offence. Participants could take a maximum of 10 items, the mean was only 8, with only a few items being returned. The mean time was under the suggested limit of five minutes. However, the upper limit of the range shows that this limit was exceeded.

Index values were computed regarding the preference for high or low value items by subtracting the number of high value items by the number of low value items. A positive score indicates a bias for high value items, whereas a negative score indicates a bias for low value items. An index score was also computed for low and high weight item preference by subtracting the number of high weight items by the number of low weight items. Again, a positive score reflected a preference for high weight items, whilst a negative score highlighted the preference for low weight items. Finally, a preference index score was computed in relation to the floor that an item came from by subtracting the first floor from ground floor. A positive score indicated a bias for items from the first floor, and a negative score highlighted a bias for items from the ground floor. These indices were constructed using the maximum possible number of items to be taken as a constant, meaning that each value is still proportionate of the total number of items possible[1]. Each index score had a possible range of -1 to 1.

Overall, it can be seen from Table 5 that the average for both the Value index and Floor index were at the midpoint. The Value index suggested that participants had a slight preference for high value items. The Floor index suggested an almost equal preference for both floors. The mean Weight index suggested a strong preference for low weight items.

[1] There were certain items that did not fit either of these categories, such as no-value/weight items (e.g. briefcase, bank card).

Correlations with the Overall Numbers of Items Taken

Pearson's correlations were used to test the association between the BPS, BCDS, BCDS subscales, Cognitive Empathy, Affective Empathy, and the overall number of items taken (see Table 6). Burglary Proclivity and the overall number of items taken were not found to be related (r = -.004, p = .98, N = 51). BCDS and the overall number of items taken were not significantly related (r = .24, p = .09, N = 51). When spilt into its subscales, Factor 1 was not significant (r = .14, p = .34, N = 51), but Factor 2 was moderately and positively related (r = .31, p = .03, N = 51).

Table 5: Descriptive statistics for behaviours elicited during the simulated burglary

Measure	Mean (*SD*)	Range
No. Items Taken	8.27 (*2.32*)	2 – 10
No. Items Returned	0.47 (*1.17*)	0 – 6
Time Taken	04:39 (*01:53*)	01:40 – 08:47
No. Low Value Items Taken	2.80 (*1.59*)	0 – 7
No. High Value Items Taken	4.14 (1.98)	0 – 8
Value Index	.13 (*.28*)	-.40 - .80
No. No-Value/Weight Items Taken	1.27 (*1.15)*	0 – 4
No. Light Items Taken	6.88 (*2.40*)	1 – 10
No. Heavy Items Taken	0.73 (*0.60*)	0 – 2
Weight Index	-.62 (*.25*)	-1.00 - .10
No. Downstairs Items Taken	4.22 (*2.04*)	0 – 10
No. Upstairs Items Taken	4.06 (*2.35*)	0 – 9
Floor Index	-.02 (*.38*)	-1.00 - .80

Cognitive Empathy was not significantly related to overall items taken (r = .24, p = .09, N = 51), whereas Affective Empathy was (r = .31, p = .03, N = 51). This provides partial support for Hypothesis 1. Finally, Emotional Reactivity was not significantly related to overall items taken (r = .03, p = .82, N = 51). This did not provide support for Hypothesis 2.

Correlations with Time Taken, and Confounding Variables

Pearson's correlations were used to explore the relationships between the time taken to burgle the house and emotional reactivity, immersive tendencies, task difficulty, immersive presence. In line with Hypothesis 3, Emotional Reactivity was found to have a negative association with time taken (r = -.23, p = .10, N = 51), however, this relationship was non-significant. Cognitive Empathy was not significantly associated with time taken (r = .09, p = .55, N = 51), nor was Affective Empathy (r = -.002, p = .99, N = 51). Time taken was not significantly associated with ITQ (r = -.17, p = .23, N = 51), or with NASA-TXL (r = .21, p = .14, N = 51) and IPQ (r = .09, p = .53, N = 51). This provided no support for Hypothesis 4. Notably, time taken was found to be negatively and significantly associated with both previous use of VR (r = .28, p = .05, N = 51) and age (r = .29, p = .04, N = 51).

Correlations with the Value Preference Index

Pearson's correlations were used to test the relationship between the Value index and proclivity, burglary cognitive distortions, and empathy. It was found that proclivity was not significantly associated to item value (r = .25, p = .09, N = 51), neither was the BCDS (r = .19, p = .19, N = 51). Also, when split into its subscales, Factor 1 of the BCDS was not significantly associated (r = .12, p = .41, N = 51) neither was Factor 2 (r = .22, p = .12, N = 51). Finally, neither Cognitive Empathy (r = -.06, p = .70, N = 51) or Affective Empathy (r = -.18, p = .21, N = 51) were significantly associated with the Value index. These results do not provide support for Hypothesis 5. However, the Experienced Realism subscale of the IPQ was found to be moderately and negatively related to the value preference (r = -.43, p = .002, N = 51). The full IPQ measure was, however, not significantly related (r = -.20, p = .16, N = 51).

Correlations with the Weight Preference Index

Pearson's correlations were run to test the relationship between Weight index scores and proclivity, burglary cognitive distortions, and empathy. Proclivity was not significantly associated to the weight index (r = .08, p = .57, N = 51). It was also found that the BCDS was not significant (r = -.11, p = .44, N = 51), neither was Factor 1 (r = -.06, p = .70, N = 51) or Factor 2 (r = -.16, p = .26, N = 51). While Cognitive Empathy was not significantly associated with the Weight index (r = -.13, p = .35, N = 51), Affective Empathy was found to be moderately and negatively related (r = -.35, p = .01, N = 51). These results provided partial support for Hypothesis 6. Additionally, it was found that that age was moderately and positively associated with weight preference (r = -.35, p = .01, N = 51).Also, forensic knowledge showed a moderate and negative association with weight preference (r = -.39, p = .005, N = 51).

Correlations with the Floor Preferences Index

The relationship between burglary cognitive distortions, and emotional reactivity and the floor preference for items was tested using Pearson's correlations. It was found that burglary cognitive distortions were not significantly associated to floor preference (r = .13, p = .36, N = 51). Similarly, Factor 1 of the BCDS was not significant (r = .16, p = .27, N = 51) neither was Factor 2 (r = .04, p = .76, N = 51). This does not provide support for Hypothesis 7. Also, Emotional Reactivity was not significantly associated with floor preference (r = -.13, p = .37, N = 51), providing no support for Hypothesis 8.

Table 6: Pearson's correlations coefficients for the independent, confounding and dependent variables (N = 51)

	No. items taken	No. Returned items	Time Taken	Value Index	Weight Index	Floor Index	No. no value/weight items
Proclivity	-.004	.23	.08	.24	.08	.06	.004
BCDS F1	.14	.09	-.11	.12	-.06	.16	.23
BCDS F2	.31*	-.09	.12	.22	-.16	.04	.17
BCDS Total	.24	.02	-.13	.19	-.12	.13	.23
Cognitive Empathy	.31*	.14	.09	-.06	-.13	-.09	.10
Affective Empathy	.25	-.03	-.002	-.18	-.35**	-.11	.08
ERS	.03	.17	-.23	.18	-.05	-.13	.005
ITQ	.35*	.07	-.17	.10	-.24	.09	.02
NASA-TXL	.01	-.12	-.21	.05	.007	-.16	-.19
IPQ	.04	-.20	.09	-.20	.004	-.008	.009
Previous VR use	.01	.04	.28*	.04	-.08	-.09	-.04
Age	-.26	-.13	.29*	-.19	.33*	-.08	-.21
Victim of Burglary	.09	-.02	-.13	.01	-.15	-.01	-.05
Forensic Knowledge	.18	.10	.13	.03	-.39**	-.23	-.09

Note: BCDS (F1/2) = Burglary Cognitive distortions scale, Factor 1, and Factor 2, ERS = Emotional Reactivity Scale, ITQ = Immersive Tendencies Questionnaire, NASA-TXL = NASA Task Load Index, IPQ = Immersive Presence Questionnaire. * $p < .05$, ** $p < .01$

Regression analysis

Multiple regression analyses were conducted to explore whether the established correlations would statistically predict burglary behaviours. Before each test, the assumption for multiple regression analysis were checked.

Overall number of items taken

The first analysis examined whether the BCDS Factor 2, Cognitive Empathy, and ITQ scores could statistically predict the overall number of items taken. Analysis of standard residuals revealed no outliers (*Std. Residual Min* = -2.28, *Std. Residual Max* = 1.37). Multicollinearity was also not a concern (BCDS F2 Tolerance = 1.00, VIF = 1.00; Cognitive Empathy Tolerance = .94, VIF = 1.06; ITQ Tolerance = .94, VIF = 1.07) and the assumption of independent residuals was met (*Durbin-Watson* = 2.02). A histogram of standardised residuals indicated normally distributed errors, whereas the P-P plot showed some deviation from the line (see Figure 4). The scatterplot showed linearity but not homoscedasticity (see Figure 4). The assumption of non-zero variances was also met (BCDS F2 Variance = 41.15; Cognitive Empathy Variance = 278.78; ITQ Variance = 188.18, Overall items Variance = .05). Based on these assumptions, the following results should be interpreted with some caution.

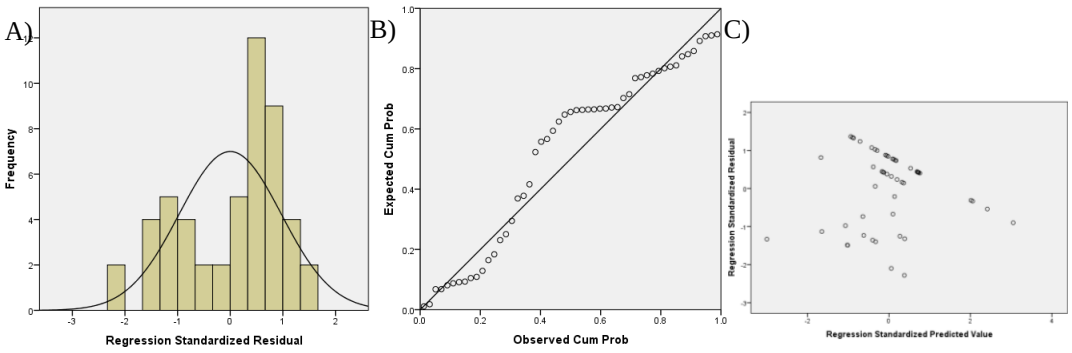

Figure 4*: A) Histogram of normal distributions of data. B) P-P plot of the normal distribution of data with significant deviation. C) Scatterplot of Standardised residuals showing heteroscedasticity.*

The regression model, which was found to be significant, (F (3, 47) = 5.38, p = .003), produced an R-squared of .26 and an adjusted R-squared of .21. Thus, 21% of the variance of the overall number of items taken was explained by the entered variables. Factor 2 of the BCDS was found to be a significant predictor (β = .28, t (47) = 2.24, p = .03), although Cognitive Empathy was not (β = .23, t (47) = 1.77, p = .08). ITQ emerged as a significant predictor (β = .28, t (47) = 2.22, p = .04).

Time Taken

This multiple regression was run to test whether prior VR Experience and Age statistically predicted the time taken to burgle the house. Analysis of standard residuals indicated that there were no outliers (*Std. Residual Min* = -1.84, *Std. Residual Max* = 2.68). Multicollinearity was found not to be a concern (VR Experience Tolerance = 1.00, VIF = 1.01; Age Tolerance = 1.00, VIF = 1.01) and the assumption of independent residuals was met (*Durbin-Watson* = 1.73). It was found that there were normally distributed errors through a histogram, and P-P plot of standardised residuals (see Figure 5). The scatterplot showed assumptions had been met (see Figure 5). The assumption of non-zero variances was also met (VR Experience Variance = 0.24; Age Variance = 144.97; Time taken Variance = 12926.89). Multiple regression was deemed appropriate for these data.

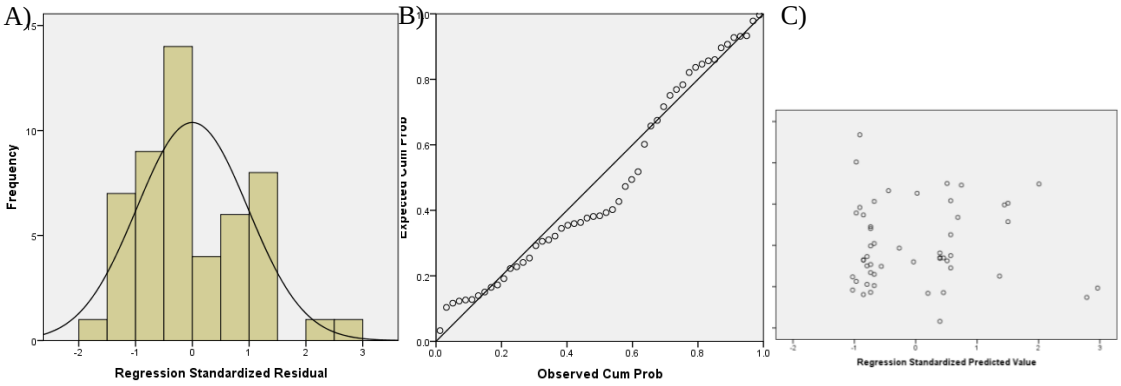

Figure 5*: A) Histogram of normal distributions of data. B) P-P plot of the normal distribution of data with minor deviation. C) Scatterplot of Standardised residuals showing homoscedasticity and linearity.*

The regression model, which was significant, (F (2, 48) = 4.31, p = .02), produced an R-squared of .15 and an adjusted R-squared of .12. Thus, 12% of the variance on the time taken was explained by the entered variables. Age was found to be a significant predictor of time taken (β = .27, t (48) = 2.06, p = .05), while VR

Experience was found to be a marginally significant predictor (β = .26, t (48) = 1.95, p = .057).

Value Index

A linear regression was used to test whether Experienced Realism was statistically predictive of preference of value for items. The assumptions of a linear regression were checked. The assumption of independent residuals was met (*Durbin-Watson* = 1.70). The assumptions of normally distributed errors, homoscedasticity, and linearity were also met (see figure 6).

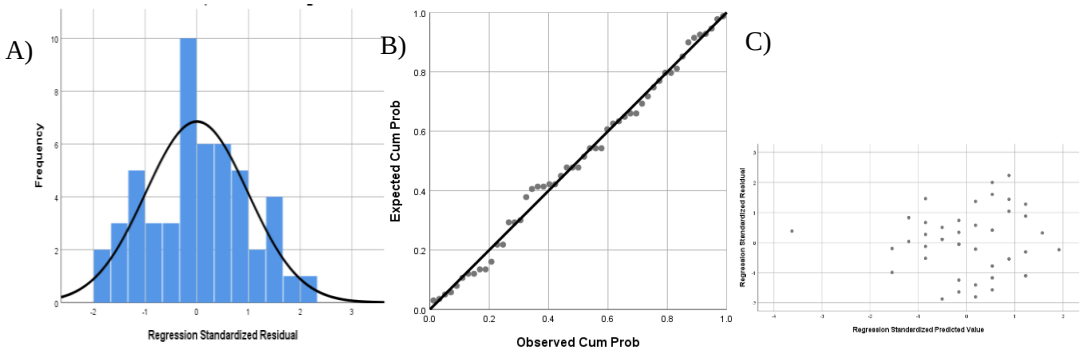

***Figure 6**: A) Histogram of normal distributions of data. B) P-P plot of the normal distribution of data with little to no deviation. C) Scatterplot of Standardised residuals showing homoscedasticity and linearity.*

The regression model, which was found to be significant, (F (1, 49) = 11.05, p = .002), produced an R-squared of .18 and an adjusted R-squared of .17. Thus, 17% of the variance of value preference for items was explained by Experienced Realism. The regression coefficient (β = -43, t (49) = -3.32, p = .002) suggested that an increase in one Experienced Realism corresponded to a decrease in preference for value.

Weight Index

Finally, a multiple regression analysis was used to test whether Forensic knowledge, Affective Empathy, and Age statistically predicted the preference for the weight of items taken. Analysis of standard residuals found no outliers (*Std. Residual Min* = -1.71, *Std. Residual Max* = 1.83). Multicollinearity was found not to be a concern (Forensic Knowledge Tolerance = 1.00, VIF = 1.00; Affective Empathy Tolerance = .87, VIF = 1.15; Age Tolerance = .87, VIF = 1.15) and the assumption of independent residuals was met (*Durbin-Watson* = 2.35). It was found that there were normally distributed errors via a histogram and P-P plot of the standardised residuals (see Figure 7). The scatterplot showed non-linearity (see Figure 7). It was found that the assumption of non-zero variances was met (Forensic Knowledge Variance =.06; Affective Empathy Variance = 194.93; Age Variance = 144.97; Weight Index Variance = .06). Due to the results of these assumptions the following results should be interpreted with some caution.

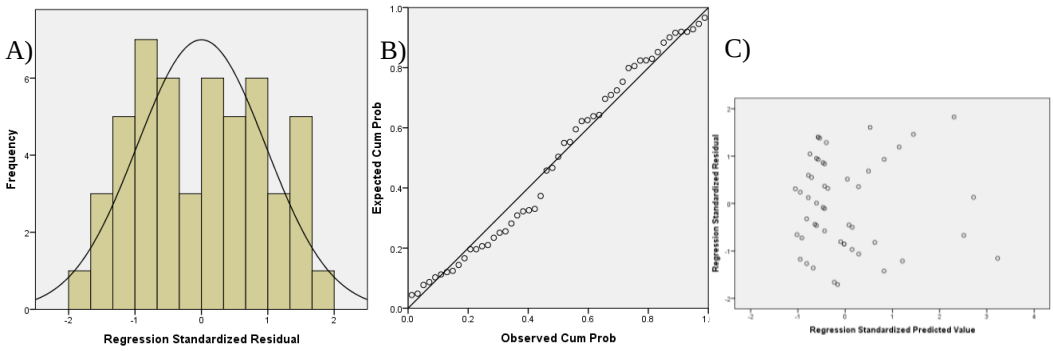

Figure 7*: A) Histogram showing a bar chart of normal distribution of data. B) P-P plot highlighting the normal distribution of data with minor deviation. C) Scatterplot of Standardised residuals showing non-linearity.*

The regression model was found to be significant, (F (3, 47) = 7.54, p < .001), and produced an R-squared of .33 and an adjusted R-squared of .28. Thus, 28% of the variance of the preference of weight for items was explained by the entered variables. Forensic Knowledge was found to be a significant predictor of the weight index (β = -.39, t (47) = -3.29, p = .002), as was Affective Empathy (β = -.27, t (47) = -2.13, p =

.04). Age did not emerge as a significant predictor of weight preference (β = .23, t (47) = 1.82, p = .08).

Burglary Typologies

Fox, and Farrington's (2012), and Merry, and Harsent's (2000) typologies were used to profile participants offence behaviours. Fox and Farrington's (2012) has 4 profiles, Organised, Disorganised, Opportunistic, Interpersonal but Interpersonal was removed due to the incapability to know the victim. Similarly, Merry, and Harsent's (2000) has 4 profiles Intruders, Pilferers, Raiders, and Invaders, however Intruders could not be used as it requires the offender to know the victim. Participants were categorised into these profiles through video analysis of their simulated burglary offence. Each profile has a list of defining characteristics, each simulated burglary was checked for what characteristics were present in their virtual offence. The profile with the most characteristics present was selected as the profile for that participant's simulated offence, this was completed for both typologies used. see Appendix 14 and Appendix 15 for the profile characteristics. There were limitations of the virtual simulation that could not replicate all the offence characteristics seen in the profiles, this is discussed later within the discussion section. Analyses were run to test the difference between the profiles of each typology in relation to the independent variables.

Fox and Farrington's (2012) Typology

To establish whether offence behaviours categorised by Fox and Farrington's (2012) profiles were associated with burglary-related variables (i.e., proclivity, BCDS factor 1, BCDS factor 2, BCDS total, Cognitive Empathy, and Affective Empathy), a

MANOVA was conducted. Assumptions were first checked and found. The participants were randomly sampled and was measured at an interval level; thus, the assumption of random sampling was accepted. Outliers were checked with Mahalanobis distance (Min = 1.41, Max = 24.96). This maximum value was higher than the critical value for this test. The single outlier was then removed, and the test was re-ran (Min = 1.41, Max = 18.50) and was now deemed acceptable. The assumption of multivariate normality was checked using Shapiro-Wilk test of normality finding significance for half of the dependent variables (Proclivity = .032; BCDS F1 = .073; BCDS F2 = .08; BCDS = .093; Cognitive Empathy = .006; Affective Empathy = .001). These results violate the assumption. The assumption of covariance of matrices was met (Box's test = .84). Levene's test of equality of error variances revealed that the dependent variables were not significant, suggesting that the assumption of homogeneity of variance was met (Proclivity p = .69; BCDS Factor 1 p = .20; BCDS Factor 2 p = .59; BCDS p = .56; Cognitive Empathy p = .65; Affective Empathy p = .48). Based on the results for these assumptions, it was deemed appropriate to use a MANOVA but with the regard to interpret the results with caution.

Table 7: Means (SDs) for burglary-related cognitions across Fox and Farrington's (2012) profiles.

	Opportunistic n = 19	**Organised** n = 21	**Disorganised** n = 8
Proclivity	42.84 (*20.06*)	51.83 (*19.87*)	55.34 (*19.73*)
BCDS Factor 1	36.74 (*8.44*)	37.33 (*13.52*)	37.52 (*8.95*)
BCDS Factor 2	25.21 (*6.77*)	22.33 (*5.54*)	25.64 (*5.90*)
BCDS Total	62.63 (*14.17*)	59.83 (*16.87*)	63.96 (13.16)
Cognitive Empathy	147.16 (*13.86*)	135.67 (*12.03*)	140.16 (*19.25*)
Affective Empathy	78.74 (*15.91*)	77.33 (*10.27*)	81.32 (*12.05*)

Note: BCDS =Burglary Cognitive Distortions Scale

The multivariate test used was Pillia's trace and suggested that there was no significant effect of profiles on burglary-related cognitions, $V = .35$, F (12, 86) = 1.54, $p = .13$, $\eta^2 = .13$. These findings do not support Hypothesis 9.

Merry and Harsent's (2000) Typology

To establish whether the typology profiles proposed by Merry and Harsent (2000) differ on the same burglary-related cognitions as in the prior analysis, a MANOVA was conducted. Participants were randomly sampled and measured at an interval level. Therefore, the MANOVA assumption of random sampling was accepted. Outliers were checked with Mahalanobis distance (Min = 1.41, Max = 24.96). The maximum value was higher than the critical value for this test. The identified outlier was removed, and the test was re-ran (Min = 1.41, Max = 18.50). The Mahalanobis distance was now acceptable. The assumption of multivariate normality was checked using Shapiro-Wilk test of normality finding significance for half of the dependent variables (Proclivity = .032; BCDS F1 = .073; BCDS F2 = .08; BCDS = .093; Cognitive Empathy = .006; Affective Empathy = .001), again violating this assumption. The assumption of covariance of matrices has been met (Box's test = .26). The assumption of equality of error variance was tested using Levene's test, and were met as the dependent variables (bar affective empathy) were not significant (Proclivity $p = .85$; BCDS Factor 1 $p = .15$; BCDS Factor 2 $p = .57$; BCDS $p = .20$; Cognitive Empathy $p = .67$; Affective Empathy $p = .016$). Based on the results for these assumptions, MANOVA was deemed appropriate to use, although with some caution.

Using Pillia's trace, a significant effect of Profile was found, $V = .46$, F (12, 86) = 2.16, $p = .02$, $\eta^2 = .23$. Univariate tests highlighted no significant difference

between profiles for proclivity, F (2, 47) =1.43, p = .25, η^2 = .06, or BCDS Factor 1, F (2, 47) = 2.48, p = .10, η^2 = .10. However, there was a significant difference on BCDS Factor 2, F (2, 47) = 5.37, p = .008, η^2 = .19, and the BCDS total F (2, 47) = 4.73, p = .01, η^2 = .17. No significant effect was found for Cognitive Empathy F (2, 47) = 1.47, p = .24, η^2 = .06, or Affective Empathy F (2, 47) = 1.29, p = .29, η^2 = .05.

Multiple comparisons were used to be determine the significant effects. This revealed no significant difference between Pilferers and Raiders for the BCDS Factor 2 (p = .16), or between Pilferers and Invaders (p = .18). However, there was a significant difference between Raiders and Invaders (p = .007), whereby Raiders scored higher. Regarding the BCDS total, no difference was found between Pilferers and Raiders (p = .53), or between Pilferers and Invaders (p = .07). However, there was, again, a significant difference between Raiders and Invaders (p = .01), whereby Raiders scored higher (see Table 8). These results partially support Hypothesis 9.

Table 8: Scores for burglary related cognitions, categorised by profiles (Merry, & Harsent, 2000).

	Pilferers n = 21	**Raiders** n = 21	**Invaders** n = 8
Proclivity Mean (*SD*)	45.81 (*19.29*)	55.76 (*19.75*)	48.00 (*19.74*)
BCDS Factor 1 Mean (*SD*)	37.86 (*9.01*)	38.95 (*9.81*)	30.88 (*5.19*)
BCDS Factor 2 Mean (*SD*)	24.38 (*5.54*)	27.67^{a} (*6.28*)	20.13^{b} (*4.12*)
BCDS Mean (*SD*)	63.10 (*13.40*)	67.38^{a} (*13.64*)	51.00^{b} (*7.63*)
Cognitive Empathy Mean (*SD*)	137.76 (*19.14*)	146.57 (*15.31*)	142.88 (*12.33*)
Affective Empathy Mean (*SD*)	77.14 (*14.82*)	83.38 (*7.30*)	77.75 (*19.91*)

Note: Different superscripts indicate a significant difference between groups. BCDS =Burglary Cognitive Distortions Scale

Discussion

The main aim of this study was to investigate the association between burglary behaviours and burglary-related cognitions. Additionally, there was a secondary aim to investigate the role of VR-related factors and how they may have confounded the

results. This was completed with a non-offender sample allowing participants to simulate a first-time burglary offence. It was hypothesised that varying burglary-related cognitions (e.g. proclivity, cognitive distortions, empathy) and emotional reactivity would be associated with offence behaviours. This was partially supported finding that Factor 2 of the BCDS, Cognitive and Affective empathy were associated to the decisions made regarding what items to take. However, there were no significant associations found between proclivity, emotional reactivity and the overall BCDS and BCDS Factor 1, with burglary behaviours, so several hypotheses were rejected. It was also found that confounding variables were also significantly associated to burglary behaviours. Furthermore, the study aimed to test the association between burglary typologies and burglary cognitions. There was very little support for the hypothesis finding that out of the two typologies only one showed a significant interaction. It was found that Merry and Harsent's (2000) typology showed a significant difference in burglary cognitive distortion for the Raider profile in comparison to the Invader profile, however no other significance was found. Each hypothesis will now be individually discussed in relation to the literature surrounding burglary.

Partial support was found for Hypothesis 1, as a positive correlation was observed between Factor 2 of the BCDS and the overall number of items taken. This Factor of the BCDS is representative of the belief that one must survive by any means. Thus, it could be argued that a stronger endorsement of this belief permits an individual to take more items during a burglary. Of course, the data are correlational, so any causal interpretations are purely speculative at this point. This association was then further explored using regression analysis. The model included the BCDS Factor 2, Cognitive Empathy and Immersive Tendencies as predictors as they were significantly associated with the overall number of items taken. It was found that the BCDS Factor

2 and Immersive Tendencies were statistically predictive of the number of items taken during the simulation. It could be argued that stronger beliefs in Factor 2 of the BCDS 'survive by any means' predicting a greater number of items taken highlights a want to earn the maximum from a burglary, thus ensuring the simulated offender's survival. This suggests that it is not only cognitive distortions that are linked to simulated burglary behaviours but also other factors, including the tendency to become immersed in a task. This signals a possible confounding variable. That is, whilst VR has been found suitable to simulate burglary, there are factors related to VR that also affect one's performance of the simulated burglary. This needs to be acknowledged and accounted for in future research so as to not inflate the interpretation of the findings.

Hypothesis 2 stated that emotional reactivity would be negatively associated with the number of items taken. This hypothesis was rejected as no significant relationship was found. This may suggest that the tendency to be emotionally reactive has no association with how many items are taken in a (simulated) burglary. Van Gelder et al. (2017) similarly found no significance when exploring the association between burglary behaviours and self-control.

Hypothesis 3 stated that time taken would be associated with emotional reactivity. This was not supported, further highlighting that emotional reactivity has no association with burglary behaviours in a sample of non-offenders. Hypothesis 4 was also not supported, as empathy, immersive tendencies, task difficulty, and immersive presence were not significantly associated with the time taken. It was expected that empathy would be associated with the time taken due to the concern for the actions that the participant was simulating. Immersive factors were hypothesised to be associated to time taken, as those who are more suspectable to immersion would feel more immersed, thus taking longer to simulate the burglary, similarly for task

difficulty it was hypothesised that those findings the simulation more difficult would take longer. However, some of the confounding variables, namely, previous VR use and Age, were found to statistically predict time taken when entered into a regression model. Previous VR use was only marginally significant. However, this finding could indicate that, if participants have used VR before, they may feel more comfortable and more familiar with its use. Thus, these participants may have taken longer in the house because they were familiar with VR and were interested in exploring the simulated environment, rather than focusing on the task at hand. The effect of Age on time taken may suggest that those who are older will take longer to burgle a property. Conversely, Patomella, Kottorp, Malinowsky, and Nygård, (2011) found that older adults find it more difficult to handle technology that has a complex design. Since VR is novel for some and is a complex technology, it may have proven difficult to handle for older participants. The procedure did incorporate a practice phase to allow participants to get used to the VR. However, it may have not been enough.

Hypothesis 5 stated that there would be an association between cognitions related to burglary and the value index scores. This was not supported, highlighting that, within this sample, beliefs about burglary are not directly associated to the value of items taken. This could be due to the low overall scores regarding these beliefs. This might also suggest that, for a non-offender sample simulating a first offence, it is not the value of each item that is important but rather the overall value of items taken. There were several items that were around the house that did not have an intrinsic value (e.g., briefcase, credit cards, USB sticks), yet these were still frequently taken by participants. Thus, the items must be deemed valuable in some way. When further exploring significant relationships, it was found that a subscale of the IPQ was negatively associated with the value of items taken. This suggests that, as higher levels

of realism are felt, the preference for the value of items is reduced. A linear regression was used and found that the model was explaining 17 percent of the variance and was statistically predicting a decrease in the preference of value. This finding may be theoretically related to empathic considerations. That is, experiencing the simulation to be like reality may lead one to consider the empathic implication of the items they take more deeply.

Partial support was found for Hypothesis 6 as Affective Empathy was significantly and negatively associated with the preference of the items' weight. However, Proclivity, Cognitive distortions, and Cognitive Empathy did not correlate significantly. This one significant association suggests that, those who score higher on affective empathy prefer to take items that weigh less. Regression analysis was used to further explore this the predictive ability of this association, along with age and forensic knowledge as a significant association with weight preference was found for these variables also. The regression model explained 28% of the variance in weight preference scores. Forensic Knowledge and Affective Empathy statistically predicted variance in weight preference scores in a negative direction. It can be argued that Affective empathy statistically predicting weight preference is due to the potential for beliefs regarding items in a house. Moreover, that heavy items might be considered as less sentimental and thus negatively predicted by Affective empathy. It was also found that those who are more knowledgeable in forensic psychology and science will take lighter items. This suggests that these participants may be more aware of the issues related to stealing heavier items, such as the difficulty of carrying these items during the rest of the offence or in a discrete manner when leaving the house. This could provide support for the theory of expertise in burglars (Nee and Meenaghan, 2006), as those who are more knowledgeable about burglary may be better at it. This has also

been shown with regards to the selection of houses, in that, police officers are better at identifying potential 'targets' in comparison to non-offenders but not offenders themselves (Logie, Wright, & Decker, 1992). Age was not found to a significant predictor of weight, suggesting that, whilst there is a zero-order association, age is not predictive of the preference for the weight of items.

Hypothesis 7 stated that empathy and cognitive distortions would be associated with the preference for what floor the items came from. This was rejected as no significant associations were found between these variables. This suggests that burglary-specific cognitive distortions and empathy are not associated with the reasons for why participants take items from the top floor of a home where they are more likely to encounter potential moral dilemmas (e.g. a child's bedrooms). Similarly, Hypothesis 8 was rejected as emotional reactivity was found to not be significantly associated with floor preference. This suggested that being highly emotionally reactive did not influence how participants react during the simulation, suggesting that emotional reactivity is not linked to the items stolen during a simulated burglary offence.

Hypothesis 9 stated that different profiles from two burglary typologies would differ on burglary-related cognitions (i.e., proclivity, cognitive distortions, empathy). Partial support was found for this ninth hypothesis. That is, for Fox and Farrington's (2012) typology, there was no significant difference between the profiles that participants were categorised into. This means that burglary-related cognitions were not different between each of these profiles.

For Merry and Harsent's (2000) typology, however, a significant effect was of 'Profile' was found. Specifically, those classified as 'Raiders' (i.e. showing Implicit Interpersonal Script, and High Craft) reported greater scores on the BCDS overall and

the BCDS Factor 2 relative to 'Invaders' (involving Explicit Interpersonal Script, and High Craft). While both profiles involve High Craft, Invaders are suggested to have Explicit Interpersonal Scripts whereas Raiders have Implicit Interpersonal Scripts. Merry and Harsent (2000) describe Explicit Interpersonal Scripts as offence behaviours that include blocking access, preparing exits, and taking items that may have sentimental value, whereas Implicit Interpersonal Scripts involve offence behaviours centred around trespassing and taking items of less emotional attachment. It can be argued that the difference in these interpersonal scripts has reflected a difference in overall BCDS scores and BCDS Factor 2 scores and suggests that burglary offences with low interpersonal scripts are associated with those with stronger beliefs in burglary cognitive distortions and distortions themed around 'survive by any means'. The link between the subscale 'survive by any means' and the low implicit scripts could be due to the thematic similarly between the concept of taking items that could have less emotional attachment. The subscale has strong themes of desperation which could highlight that the offence is not occurring for the most gain possible but to gain enough to survive thus mitigating the effect to the victim. The Raider profile is regarded as respectful and the victim is regarded as a caretaker of items (Merry & Harsent, 2000). The overall BCDS being associated could mainly be due to the 'survive by any means' subscale, as well as some of the items on the 'acquisitive entitlement' subscale could be associated with feelings of power and dominance, without hostility displayed in the Raiders profile (Merry & Harsent, 2000).

Limitations

There were several limitations of the virtual burglary house used for the simulation. There was a bug encountered early on during testing where participants were unable

to grab and interact with items that were not able to be taken. This then reduced the immersion of the simulation and stopped participants from being able to interact with items properly. Within the house items could not be picked up and interacted with, and either placed back down or, if they wanted, could not be thrown. This did restrict participants from simulating the vandalism aspect of burglary and, therefore, restricted the capability to fulfil some of the requirements for categorising the typological profiles. Similarly, the simulation could not accommodate for all the profiles, Intruders in Merry and Harsent's typology (2000) and Interpersonal in Fox and Farrington's (2012), as they required knowing the owner of the property. Additionally, these profiles also required the ability to desecrate the property using bodily functions, which poses ethical and immersive concerns, so was not included in this study.

It was noted in Chapter 2 that scores on the burglary-related cognition measures were low, scores on these measures used in Chapter 3 were lower. Particularly it can be seen that scores for the BPS were lower than scores in Chapter 2. Chapter 3 was conducted in a lab with the experimenter present, which may have caused a response bias. As mentioned in Chapter 2 a Social Desirability Scale (Crowne, & Marlowe, 1960) could have been used to check for this bias, the same can be said for this study as well to ensure that responses were not biased, and that participants were not faking being good.

Another limitation of this study is that some participants had existing experience with VR. This confounding variable was found to be significantly associated with the time taken during the simulated burglary and was found to be marginally significantly predicting the time taken. Whilst the study gave participants time to acclimatise to VR and understand the controls, the study took an hour to complete, and this may have caused participants to disengage from the task if they had

not come to grasp the controls. Whereas it could be argued that those who have previous experience with VR might have found the simulation easier. For future research it may be necessary to further investigate participants experience with VR, or allow for more time to acclimatise to VR, potentially using a separate session prior to the study using an unrelated task to allow for experience with VR.

Future Research

Further research could include using a similar research paradigm but with more complex VR technology. Recently, upgrades to this technology has enabled the ability to track eye movements and fixation points. This study has established the cognitions related to burglary, allowing future research to investigate the implicit differences (e.g. eye-tracking fixations) between those who are scoring higher on burglary related cognitions as well as investigating the differences between those who are considered experts, and non-offenders. This could then provide further evidence to the theory of expertise as experts may fixate on items of interest whilst those who are novices would scan around the room in search of the most valuable items. Additionally, it may be found that non-offenders fixate on items that are not realistic to take during an offence, due to weight and size for example.

Empathy has been shown to be a significant factor in simulated burglary offending, so it is suggested that future research further highlights the role of empathy in simulated burglary offences. When examining quarterly breakdowns of burglary offence rates, it can be seen that offence rates are higher in October to December (2018; 81,221) opposed to, April to June (2018; 69,820), July to September (2018; 71,045) and January to March (2019; 74,064). It can be surmised that this rise in

offence rates can be poised on Christmas and the added pressure. Not only is this an increase in offence rates, but additionally morally charged decisions. During this Christmas period, moral dilemmas would be more frequent as there is now the opportunity to steal presents. Thus, empathy could potentially have a more prominent role.

Conclusion

In conclusion, this study has shown that certain burglary-related cognitions are associated with burglary behaviours in a non-forensic sample. Specifically, it was found that the belief 'survive by any means' was related to the number of items taken during a simulated burglary. Additionally, a preference for taking lighter weighted item was associated with Forensic knowledge and Affective empathy. These results suggest that offence behaviours may be influenced by an individual's existing cognitions related to burglary. Furthermore, cognitive distortions related to burglary appear to be stronger in those showing a Raider profile based on Merry and Harsent's (2000) typology in comparison to the Invader profile. Further highlighting the role of burglary cognitive distortions on simulated burglary offence behaviours. This research can be used by forensic practitioners to help guide efforts when exploring how a burglar's offence behaviours were justified. This provides a useful insight into some of the belief structures guiding the burglary offences.

4

General Discussion

Summary of Findings

Cognitive Distortions

One of the main findings of this research project has been the uncovering of burglary-related cognitive distortions. These offence-related cognitions have been found to be statistically predictive of the inclination to commit a burglary offence, and thus could be further related to burglary offending. It can be argued that the cognitive distortions highlighted in Chapter 2 have risen from existing beliefs as the participants were non-offenders and therefore could not have developed justifications for repeated offending. This is similar to what Szumski et al., (2018) suggest in Mechanism I, this theory however is focused on sex offenders, similar research could be conducted on burglars once further work has been done examining burglary cognitive distortions. Additionally, this work could highlight that there may be implicit beliefs behind these distortions. These implicit beliefs need to be investigated to further understand some of the underpinning (e.g. attitudes, beliefs, and concepts) of cognitive distortions (Ward, 2000). Additionally, it may also be possible to build upon the existing measure by uncovering other cognitive distortions and implicit beliefs by working with burglary offenders.

It was additionally found that general criminal cognitive distortions were also predicting the proclivity to burgle, It could be argued that there is much overlap thematically between burglary and general criminality, which can additionally be reflected when examining most burglars diverse criminal histories that are not limited to just burglary (Vaughn et al., 2008). Further research would need to be conducted to explore this association, which in turn could reveal into how burglary can act as a gateway crime for juveniles (Taylor et al., 2001), as well as for sexual offences (Sample & Bray, 2003).

It has also been that seen that burglary cognitive distortions are predictive of the overall number of items taken, specifically the second subscale of the BCDS 'survive by any means'. There was a positive relationship between these variables highlighting that those who had stronger beliefs related this subscale 'survive by any means' took more items in comparison to those who did not strongly believe in these cognitive distortions in the simulated burglary offence. Factor 2 of the BCDS has strong themes of the need to survive and desperation, therefore it could be argued that these beliefs are guiding offence behaviours as participants believe that they need to take as many items as possible to ensure their survival. This could be further explored and replicated in a burglar sample. This thesis has not only shown that these cognitive distortions are predictive of the proclivity to burgle but additionally predictive of offence behaviours. This highlights the importance of this cognition on burglary offending, as well as the burglary cognitive distortions and the 'acquisitive entitlement' subscale.

Empathy in Burglars

This thesis has suggested that empathy is influential on burglary. It was found that cognitive empathy the ability to recognise and understand what an individual should be feeling had no significant association with the proclivity to commit burglary. However, general and burglary specific affective empathy were found to be positively associated with the proclivity to burgle, yet, were not found to be statistically predictive of burglary proclivity. This finding could be due to the sample being non-offenders and thus, despite having high proclivity to burgle, it could be argued that this empathic response was one of the contributing factors in the choice not to offend. Therefore, this positive association could potentially highlight that the strong empathic

response may be a mechanism in the resistance against committing burglary. Thus, should be posed a factor of interest if investigating into the factors that are linked to what helps an individual resist committing an act of burglary.

It was found that cognitive empathy, positively correlated with both subscales of the BCDS. This highlights the role of empathy on burglary cognitive distortions, following Marshall's et al., (2001) theory that high levels of cognitive empathy, correlate with high beliefs in cognitive distortions. Additionally, it also found that affective empathy was also positively linked to burglary cognitive distortions, Marshall et al., (2009) also found that affective empathy was additionally positively linked. Marshall et al., (2009) could not offer an explanation to why at the time. It is uncertain why this is the case, but it could be suggested that empathy plays a mediating role in the relationship between cognitive distortions and pro-social or anti-social behaviours. Whilst this theory is poised in research about sex-offenders this study has shown that there is potential for the theory to be supported in burglars as well.

When exploring the role of empathy regarding burglary behaviours it was found that cognitive empathy was significantly associated with the number items taken. The findings suggest that participants could recognise other's emotions, and that this increased recognition was associated to the increased number of items taken, suggesting that participants were not considering the victim of the property. This could be due to the design of the study in Chapter 3, empathy was measured before the offence and as a trait. To truly understand the link between empathy and a simulated offence state empathy would need to be measured. However, measurement of empathy would be difficult during the simulated offence. Instead empathy could be measured before and after and differences in scores could be analysed. Thus, further investigating into how empathy is associated with offending behaviours, could reveal

into some of the factors that moderate the empathic response and thus provide insight into factors that could be targeted in rehabilitation or prevention.

It was found that for affective empathy a significant negative association with weight of items was found, highlighting the role of affective empathy on offence behaviours. The negative association highlights how there may be beliefs about items that prevents an individual from taking certain items. It could be argued that this empathic concern guides offence behaviours to take heavy items that may not have as much sentimental value to the owner. This shows that empathy does influence offence behaviours, however, not enough is known so more research on this topic is warranted. Overall what can be stated is the importance of the role of empathy in burglary offences, empathy has been found to not only be influencing the proclivity to burgle but additionally the behaviours during a burglary. Empathy needs to be further investigated, yet it can be highlighted as pertinent in burglars and therefore should be highlighted in any rehabilitative treatment focused on burglars.

Human Needs in Burglars

Human needs were explored in Chapter 2, as they have been found to be effective in the rehabilitation of the burglary offenders (Taylor, 2017). However, in a sample of non-offenders it was found that there was no significant relationship between any of the human needs with any of the burglary-related factors. This shows that these needs are not related to the inclination to commit a burglary offence, but perhaps instead may better associated to repeated offending. It is suggested that a link be made between some of the highlighted factors of this thesis (i.e. cognitive distortions, and empathy) and the GLM. This could provide insight into how external factors are influencing

human goods to be fulfilled in anti-social manners as well as help justify offence behaviours. Taylor (2017) highlights how burglars are fulfilling different human goods through their offending, thus human goods additionally need to be researched in relation to burglary behaviours. It is expected that offenders who aim to fulfil human goods such as *Excellence in Work* may display an expertise in offending and may target high-value items, whereas an offender using burglary to fulfil the human good *Happiness* may take items for thrill for their own biases (e.g. alcohol, cigarettes, and even where possible illegal drugs). Ward, and Marshall (2004), highlight that the GLM allows researchers to gain insight into aetiological factors by examining the association of human goods on offence behaviours.

Proclivity

Proclivity has been found to a useful in the measuring of the proneness to commit a burglary offence. Whilst overall scores are low for proclivity, it was still found that proclivity was predicted by burglary cognitive distortions, and general criminal cognitive distortions. Furthermore, proclivity was significantly associated to global and burglary affective empathy. However, it was not found that proclivity was associated to any simulated offence behaviours. What these findings highlights is that proclivity can measure the proneness to commit a burglary offence but cannot be linked to the behaviours committed during an offence. The Burglary Proclivity Scale can be used in clinical and forensic populations to explore this inclination to commit burglary. This measure could be used with those who have already committed burglary and might offend again, as well as those who are at risk of committing a burglary offence, with the aim to dissuade them from offending.

Virtual Reality and Related Factors

Chapter 3 has helped further highlight the capability of Virtual Reality (VR) to effectively research burglary and more generally forensic psychology. Not only can VR be used to simulate offences by mitigating ethical concerns, but additionally VR can be used to explore factors found to associated to that offence. The aim of Chapter 3 was not only to unpack the role of cognitions related to burglary in simulated burglary offence but additionally how factors related to the use of VR affects the simulated burglary offence. It was found in Chapter 3 that previous VR use was associated with the time taken in the simulation, and Immersive Tendencies were significantly associated with the overall number of items taken. Experienced Realism, a subscale of the IGroup Presence Questionnaire was found to significantly predict variance of the value index preference, highlighting that those who found the simulation as more realistic, to more items of value. These confounding variables are important to identify, as the factors directly affect a participant's ability in VR, and thus may alter their experience. Thus, it can be highlighted whether the variables of interest are the main contributing factors when simulating criminal offences.

Implications

The aim of this thesis was to provide some initial insights into the factors related to burglary. Chapter 2 has revealed into some of the factors related to the initial proclivity to burgle, allowing for future work to focus on examining the effectiveness of these measures on those who are potentially at risk of offending. It was found that burglary cognitive distortions and general criminal cognitive distortions predicted proclivity,

highlighting the role of cognitive distortions in the initial inclination to commit a burglary offence. Thus, cognitive distortions and be poised as a factor of interest in the investigation into the factors related to burglary. It was additionally shown that affective empathy was associated to the proclivity to burgle, in the non-offender sample it is argued this might a mechanism in the choice not to offend. Additionally, once these findings have been replicated and expanded upon with a burglar sample, it can be identified how effective targeting these measures are in rehabilitative efforts with those who are repeat offenders.

Chapter 3 has highlighted the role of cognitive/affective factors during offending. The study found that an individuals' cognitions predict their offending behaviours, provides insights for policing and rehabilitation. Namely, it was found that the overall number of items taken were predicted by burglary cognitive distortions and was associated to cognitive empathy. Whilst weight was predicted by affective empathy, and forensic knowledge. These factors can be focused upon during treatment once replicated in a burglar sample and allow for the insight into how offending behaviours are guided by the offender's beliefs. Additionally, it was also found that several VR-related factors were predicting variance on simulated burglary behaviours highlighting that whilst VR is useful as a methodology it can confound the results. It was also examined how burglary-related cognitions were linked offender typologies; this can be used by the police to further understand the profile behind the typology of an offender. Furthermore, in turn this can also be used in rehabilitation to focus upon aspects of an individual's offending behaviours. In particular how certain cognitions may be justifying these behaviours, therefore those beliefs can be identified and worked upon to highlight the dysfunctionality. Overall what this study has shown is

there is an initial link between offence behaviours, and cognitions, which provides a basis for research and rehabilitation to work upon.

Limitations

A strong limitation of research on burglary is how the research quickly becomes outdated due to the changes in what is valuable in society. Most of the older burglary research is pinned on taking valuable jewels, and antiques (Rengert, & Walischick, 2000), whereas more recent research has shown that burglars pose more value in portable technology (Nee et al., 2019; Meenaghan et al., 2018). Thus, several of the measures that have been designed as well as the VR house will need constant validation and updating for them to remain useful in clinical, and forensic populations.

One of the major limitations of this research is the low scores on the burglary-related measures, this was seen in both studies. It can be suggested that these low scores are due to a response bias to seem socially desirable. The research is poised on burglary and therefore individuals may not want to seem to be endorsing of factors related to burglary. It can be seen that scores are even lower in Chapter 3 in comparison Chapter 2, this could be due to that the study took place in a laboratory with the researcher present whilst the participant was completing the measure. Future research should aim to use these measures to ensure that these biases are not encountered, there are several measures that measure social desirability. Social desirability has been linked negatively to self-reported criminality (Mills, Loza, & Kroner, 2003), highlighting the importance of social desirability when measuring offence-related topics.

Future Research

One of the key follow-on pieces of research from this thesis is the validation of the varying measures used. By validating the measures using a burglar sample the measures can be used for more extensive work, and for use in clinical and forensic populations. Additionally, there is the lack of cross validation. The measure has been validated in U.S.A. and U.K., but the measures have not been validated for other regions of the world. Further research should aim to validate these measures in other cultures using different languages. Therefore, these measures may be used in prisons with those whose first language is not English as well as being used in countries that do not speak English.

Burglary-related cognitive distortions have been found to prominent in relation to burglary, thus it is suggested that cognitive distortions be further investigated. Working directly with offenders may provide insights into these cognitive distortions and could further unpack some of the implicit theories that could be behind the cognitive distortions. Additionally, this could provide refinement for the BCDS, validating the measure further if required. There are also other attitudes that should be explored, for instance it can be seen in the theory of expertise of burglars (Nee and Meenaghan, 2006), that many burglars treat their offending as a primary source of income (Rengert, & Walischick, 2000) even regarding the money gotten from a burglary as a wage (Taylor, 2017). This suggests that there are dysfunctional attitudes related to work, with burglars not finding satisfaction with a normal job but instead choosing to burgle. Rengert and Walischick (2000) highlight that many burglars claim they left their jobs either due to the low amount of pay in comparison to burglary, or that traditional work hours clashed with optimal hours to burgle. This allowed some offenders to live a “party lifestyle” as they did not have to go to work. These attitudes

towards work could reveal into some of the factors that help an individual initially chose to change from a pro-social lifestyle towards an anti-social lifestyle.

Chapter 2 of this thesis has revealed into the factors that linked to the proclivity to burgle; what future research can identify is the factors related to the resistance to commit a burglary offence. By highlighting how the general public are resilient to burglary, it can be highlighted how to work with burglary offenders to build a resilience to offend against burglary. This can be achieved using a pro-social stance, targeting specific needs and factors that could be considered enabling of burglary.

Additionally, it has also been highlighted that for some burglary is a group offence where each member plays a role. Mercan (2018) conducted a longitudinal study with a 'crew' of burglars in Turkey. Mercan's (2018) study was conducted over 20 years and highlighted how the crew's offending behaviours had changed as they grew older. Notably the study unpacked the role of each of the members within the crew, finding that some would act as lookouts whilst others would be the actual burglars. This group interaction provides insight into how burglary can be a group crime, instead of committed by a single person. By burgling in groups there is now the additional factor of peer pressure, and concerns of whether someone can leave the group. These factors combined change what is known about burglary and makes rehabilitation more difficult, as it not only personal factors that have to be targeted but additionally their social structures.

Conclusion

This thesis aimed to provide new insights into the factors that influence burglary offending, specifically what predicts burglary proclivity and to establish some of the

key factors that are linked to burglary-related behaviours. It was found that both general criminal cognitive distortions and burglary cognitive distortions predicted burglary proclivity. Additionally, associations were found with affect empathy. This Provided initial insights into factors related to the proclivity to burgle, which can in turn be used by forensic practitioners when working with burglary offenders or those at risk of committing burglary to dissuade them from offending. Whilst initial findings are promising, more research does need to be conducted to further explore these findings. Regarding the simulated burglary offence, it was found that burglary cognitive distortions, cognitive empathy, and affective empathy were associated to key burglary offence behaviours. This highlights how an individual's existing beliefs may influence their offence behaviours. Additionally, it was found that the Raider profile in Merry and Harsent's typology had higher scores on burglary cognitive distortions than the Invader profile, further highlighting the role of burglary cognitive distortions on offence behaviours as well as burglary in general. These findings can be used by forensic practitioners to explore a burglar's offending behaviours and some of the beliefs that justified those behaviours.

As a result, further research can be conducted using this research as a basis to develop new theoretical frameworks of how burglars initially and repeatedly offend. Such a theory would highlight the key cognitions that this thesis has begun to identify as being linked to burglary. A new model can, in the future, inform professionals of how to work in a rehabilitative manner with adult burglary offenders, as well as those potentially at risk of offending. Thus, helping reduce burglary offence rates, and the impact of burglary on its victims and society.

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Appendix 1: *Burglary Cognitive Distortions Scale after factor analysis*

Please rate how much you agree with the following statements about justifying burglary.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree	Subscale
If someone cannot protect their home from invasion, then someone else has the right to burgle it.								Acquisitive entitlement
Burglary is a form of justice against those born with a silver spoon.								Acquisitive entitlement
Money is money at the end of the day, it doesn't matter how you get it.								Acquisitive entitlement
People don't care if their stuff is taken, as it is all insured.								Acquisitive entitlement
Burglary is more fulfilling than work.								Acquisitive entitlement
As long as you don’t go too far, it’s fine to break the law to get what you deserve.								Acquisitive entitlement
If a person can't afford to live, it should be fine to burgle houses to survive.								Acquisitive entitlement
There are those with everything and it needs								Acquisitive entitlement

sharing equally, even if it has to be taken from them.								
People make such an issue out of the possessions that they lose in a burglary – it's just stuff.								Acquisitive entitlement
Many over-exaggerate the effect that being burgled has on them.								Acquisitive entitlement
Burglars are smart and impossible to catch.								Acquisitive entitlement
Some people are immoral, as so being burgled is karma.								Acquisitive entitlement
Anyone so careless to not properly secure their house is partly to blame for being burgled.								Acquisitive entitlement
People would burgle from you if they had the chance and needed the money.								Acquisitive entitlement
When people get burgled, they lie to claim back more that they lost. So, everybody wins.								Acquisitive entitlement
The need to burgle builds and eventually bursts out.								Acquisitive entitlement

If the positions were swapped, victims of burglary would resort to burglary to survive.								Acquisitive entitlement
If someone is being burgled multiple times, it is probably their fault.								Acquisitive entitlement
By having nice things on show in a home, people are inviting burglars in.								Acquisitive entitlement
Nowadays jobs pay so little, so an easy way to make money is through burglary.								Survive by any means
Some people are forced to burgle due to the demand our society places on wealth.								Survive by any means
Burglary is a thrill ride, it gives you a rush.								Survive by any means
Some people are not burglars - they are just out of luck and trying to get by.								Survive by any means
The elderly are easy victims of burglary.								Survive by any means
While I can take from those who								Survive by any means

have many things, kids and the elderly should not to be victimised.								
Burglars will harm you and your family to get what they want, you are just in the way.								Survive by any means

Appendix 2: *Burglary Empathy Measure*

General scenario: In this section, I want you to think about an adult who was disfigured in a car accident and had to spend a month in hospital. The woman is now out of hospital and will live with a permanent disability.

Burglary scenario: In this section I want you to think about an adult who has been burgled by you. The owner has found the house has been damaged and many of the possessions are gone.

Part 1: Indicate the degree to which you think this adult would be experiencing the following, emotions, thoughts, and behaviours.

	Extremely Unlikely	Moderately Unlikely	Slightly Unlikely	Neither Unlikely nor Likely	Slightly Likely	Moderately Likely	Extremely Likely
Guilt							
Sad							
Angry							
Self-confident*							
Nightmares							
Fearful of new people							
Suicidal Thoughts							
Problems at work							
Fearful of being hurt							
Successful at work *							
Afraid to leave their house							
Adjusted view on the security of their home *							
Sleep disturbances							
Feelings of loneliness							

Withdrawn from others							
Tense							
Relaxed*							
Has psychiatric problems							
Has low energy							
Shows a tendency to blame themselves for all problems							
Feelings of helplessness							
Argues with others							
Fearful of being alone							
Tendency to cling to friends							
Proud of self*							
Is in pain							
Troubled							
Feels upset							
Feels dirty							
Ashamed							
Note - * reversed scored items.							

Now indicate how you feel about what this person has experienced. Please circle the number that best indicates how you feel about this person's experience.

	Extremely Unlikely	Moderately Unlikely	Slightly Unlikely	Neither Unlikely nor Likely	Slightly Likely	Moderately Likely	Extremely Likely
Guilty							
Sad							

Angry							
Happy*							
Pain							
Affection*							
Upset							
Proud							
Devastated							
Helpless							
Responsible							
Sick							
Good*							
Frustrated							
Hopeful*							
Trusting*							
Ashamed							
Disgusted							
Curious*							
Shocked							
Note - * reversed scored items.							

Appendix 3: *Human Needs Scale*

Please rate of the following scale how satisfied you are about achieving these common life goals.

	Very Unsatisfied	Unsatisfied	Slightly Unsatisfied	Neither Unsatisfied nor satisfied	Slightly satisfied	Satisfied	Very satisfied	Please state how you would go about achieving this.
Healthy Living.								
Good basic functioning.								
Basic Survival.								
Knowledge – learning and knowing.								
Excelling at work.								
Excelling at play.								
Personal choice and independence.								
Peace of mind – Freedom from emotional turmoil.								
Friendship.								
Intimate Relations.								
Familial Relations.								
Community – belonging in a group.								

Spirituality – having long term goals and purpose.								
Happiness.								
Creativity – Being unique in all aspects of life.								

Appendix 4: *Burglary Proclivity Scale*

You are about to be shown a series of short stories. Please read them and answer the questions after.

Vignette 1 (Opportunistic): You missed a few days of work this month and you have run out of sick days and cannot afford this month's rent. You decide to go into work and explain to your boss that you need the money. Whilst walking along, you see someone leave their house and forget to lock the door. You stand there and consider burgling the house, figuring you can make enough money for rent this month. You enter and steal a few pieces of jewellery and fill a small bag with a laptop and leave. You reckon you have made around £600, which will cover what you need.

Vignette 2 (Planned): You and your friends plan to go on holiday next summer. But you have a credit card debt of £500 you are struggling to pay off and have had to move back in with your parents. Your parents tell you to forget about the holiday and pay off your debts. You explain to your friends that you cannot afford the holiday. Your friends don't seem phased and plan to go without you. You can't help but feel left out and jealous since it was your idea. You need to raise the cash. That night, you plan to go the posh end of town and burgle someone. You think about how rich these people are and how much you are struggling. You burgle a house and take all their jewellery. But one house isn't enough, so you burgle six more houses that night. You feel proud that you've stolen from the rich and that someone who needs the money now has it. You can now afford that holiday and might also be able to pay off your debts.

Vignette 3 (Opportunistic): You are walking home late one night after a hard day at work. You see a man leave his home and walk down the road. You notice that he left a window open. You quickly climb through the window and have this immense feeling of adrenaline. You run around the house grabbing everything you can carry, stuffing your pockets with jewellery. You feel almost high. As you go through a corridor, you knock over a vase. It loudly shatters, which scares you. You decide to run. You climb back out the window and quickly run home.

Vignette 4 (Planned): You haven't been employed for the last year and have been burgling instead. You realise you've become good at it but are sick of robbing housing with little value. So, you begin to devise a plan that will earn you a lot of money. You steal a car from outside a nice house and hide it in your garage at home. You return the car the following day with a note describing that your wife had just had a baby and you had to rush her to the hospital as you could not get an ambulance. You took their car and saved the mother's life as there were complications. In the note, you leave money to replace the window you smashed along with 2 tickets to a play at the local theatre this Friday night at 7 pm. That Friday, you camp outside the house and watch as the same couple leave for the play. You then burgle the property, taking quadruple that which you gave to them (including the tickets for the play). The money that you got from the burglary will fund a good week of partying and a few new nice clothes to impress others, as well as your rent.

Vignette 5 (Opportunistic): It's been a rough year for you. Your marriage ended, you got sacked, and you never see your daughter anymore. She was all you cared about and without her, existence is becoming meaningless. It's your daughter's 7th birthday

in a week and you take one last chance to do right by her by and getting her a doll. You try to find the doll, but it sold out everywhere. You go to the pub that night ready to drown your sorrows. You overhear the guy next to you talk about how he got the last doll at the toy store for his daughter. You'd do anything for your daughter even steal from another child. The next morning you watch the family leave. You kick in the door and head straight into the kids' room and take the doll and leave. Your daughter loves the gift and it fills you with joy to see her.

Vignette 6 (Planned): You spent a long weekend drinking, but now you are skint. You don't think you have enough cash to do anything fun. You start scrolling through Facebook and see that your friend has gone on holiday. You feel this impulsive urge to go out and burgle them. You find yourself outside their door holding a spare key that you know was under a plant pot. You know they have a new Xbox, and that their partner has a lot of expensive jewellery. You burgle their house taking as much as you can, filling the boot of your car with their stuff. You feel such a rush, almost like you are high. You drive away with your heart racing out of your chest.

In this situation, how excited do you think you would feel?	Extremely unexcited	Moderately unexcited	Slightly unexcited	Neither unexcited nor excited	Slightly excited	Moderately excited	Extremely excited
In this situation how fulfilled do you think you would feel?	Extremely unfulfilled	Moderately unfulfilled	Slightly unfulfilled	Neither unfulfilled nor fulfilled	Slightly fulfilled	Moderately fulfilled	Extremely fulfilled
In this situation, could you see yourself doing the same?	Extremely Unlikely	Moderately Unlikely	Slightly unlikely	Neither unlikely nor likely	Slightly likely	Moderately likely	Extremely likely

Appendix 5: Psychological inventory of criminal thinking styles – layperson edition – short form.

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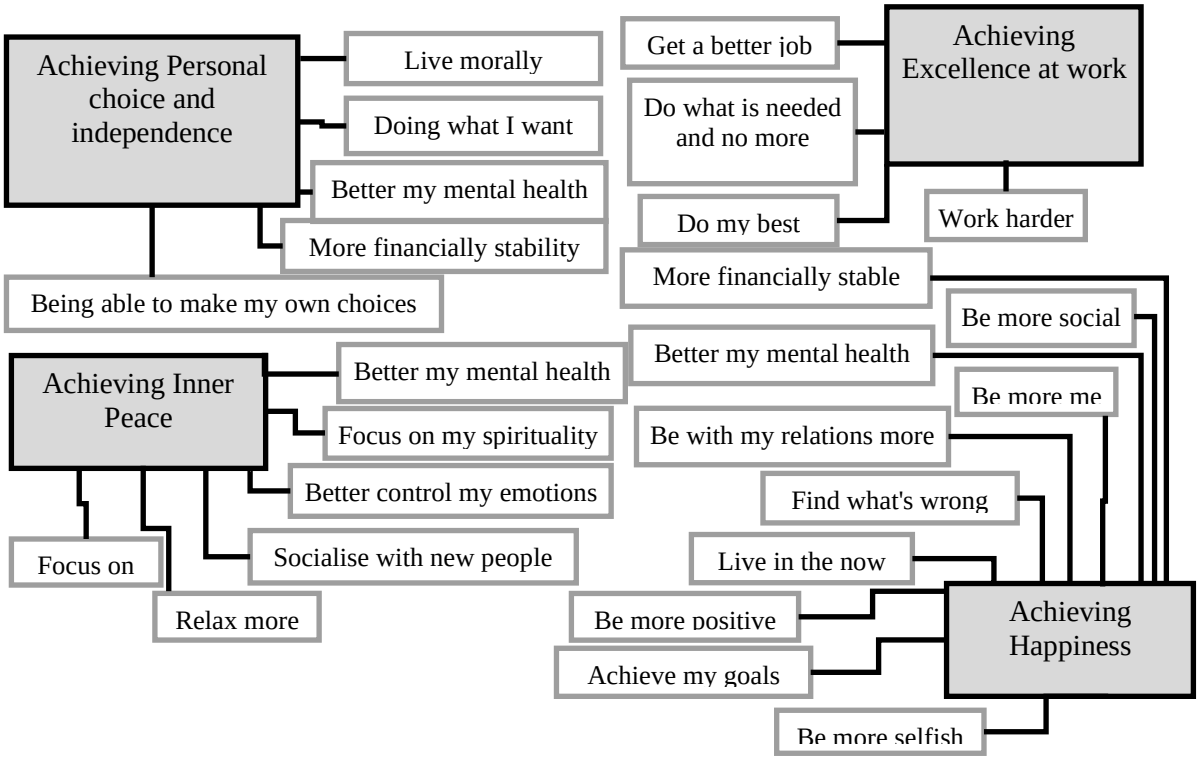
	1 - disagree	2 – uncertain	3 - agree	4 – strongly agree
I Get what I want				
I have trouble remaining focused				
I said “the hell with it” and did whatever I want				
I was justified in taking what I want				
I Will never be caught				
Breaking the law is no big deal				
I can get money anyway if friends or family needed help				
I am uncritical of my thoughts				
I often find myself saying “screw it”				
I will start an activity then never finish it				
Society owes me				
Things will work themselves out				
I used drugs or alcohol before doing something risky				
I would be willing to do anything				
Have justified my behaviour				
I have trouble following through on good intentions				
I felt above the law				

I act impulsively				
I put off what should have been done today				
I have thought “No way they would catch me this time”				
I have difficulty critically evaluating thoughts				
I’ll just take it				
I can use drugs and avoid the negative consequences				
I find myself easily side-tracked				
I have trouble controlling angry feelings				
I’m the one that deserves special consideration				
I tend not to obtain goals because I am distracted				
I throw rational thought to the wind				
I felt entitled to break the rules.				
I rarely consider consequences				
I could do anything and get away with it				
I have cancelled plans so I could behave irresponsibly				
I push problems to the side				
I give myself permission to do irresponsible things				
Reference - Mitchell, Bartholomew, Morgan, and Cukrowicz, (2017).				

Appendix 6: *Thematic Analysis of acquisition of human needs*



Appendix 7: Emotional Reactivity Scale

Question	Not like me at all.	Slightly like me.	Somewhat like me.	Very like me.	Completely like me.	Subscale.
5. I tend to get very emotional very easily.						Sensitivity
9. Even the littlest things make me emotional.						Sensitivity
3. When I experience emotions, I feel them very strongly/intensely.						Arousal/ Intensity
1. When something happens that upsets me, it's all I can think about it for a long time.						Persistence
6. I experience emotions very strongly.						Arousal/ Intensity
19. My moods are very strong and powerful.						Arousal/ Intensity
15. My emotions go from neutral to extreme in an instant.						Sensitivity
8. When I feel emotional, it's hard for me to imagine feeling any other way.						Persistence
20. I often get so upset it's hard for me to think straight.						Arousal/ Intensity
2. My feelings get hurt easily.						Sensitivity
4. When I'm emotionally upset, my whole body gets physically upset as well.						Arousal/ Intensity
11. When I am angry/upset, it takes me much longer than most people to calm down.						Persistence
17. People tell me that my emotions are often too intense for the situation.						Arousal/ Intensity
7. I often feel extremely anxious.						Sensitivity
13. I am often bothered by things that other people don't react to.						Sensitivity
14. I am easily agitated.						Sensitivity
18. I am a very sensitive person.						Sensitivity

21. Other people tell me I'm overreacting.						Arousal/ Intensity
16. When something bad happens, my mood changes very quickly. People tell me I have a very short fuse.						Sensitivity
10. If I have a disagreement with someone, it takes a long time for me to get over it.						Persistence
12. I get angry at people very easily.						Sensitivity

Appendix 8: Screening Measure

Screening Form

We operate this study according to the University of Lincoln Health and Safety Guidelines for Virtual Reality (VR) equipment. However, before you take part, it is important to determine whether you have any conditions which might impair your ability to use the VR equipment safely or otherwise pose harm to your person.

Please click either 'yes' of 'no' to answer the following questions. If you need any help of wish to ask for further clarification, please ask:

Have you ever used a virtual reality headset before	YES/NO
Do you suffer from Epilepsy, or a similar condition which may be triggered by flashing lights of visual stimulus?	YES/NO
Do you suffer from any significant uncorrected problems with your vision, such as tunnel vision? (This excludes the requirement for glasses or contact lenses).	YES/NO
Are you pregnant?	YES/NO
Do you suffer from any conditions (e.g. related to mobility) which could cause you to be unduly injured by bumping into objects, or people, of by falling to the floor?	YES/NO
Do you suffer from any other condition which you think might affect your ability to use the VR?	YES/NO

Please do ask if you would like to discuss anything relating to these questions. Please do not take part in the study if you have any of these or suspect there may be problems with either your vision or your balance that are likely to affect you adversely during this study.

Appendix 9: Immersive Tendencies Questionnaire

Question	7-point Scale		
1. Do you ever get extremely involved in projects that are assigned to you by your boss or your instructor, to the exclusion of other tasks?	1- Never	4- Occasionally	7- Often
2. How easily can you switch your attention from the task in which you are currently involved to a new task?	1- Not So Easily	4- Fairly Easily	7- Quite Easily
3. How frequently do you get emotionally involved (angry, sad, or happy) in the news stories that you read or hear?	1- Never	4- Occasionally	7- Often
4. How well do you feel today?	1- Not Well	4- Pretty Well	7- Excellent
5. Do you easily become deeply involved in movies or TV dramas?	1- Never	4- Occasionally	7- Often
6. Do you ever become so involved in a television program or book that people have problems getting your attention?	1- Never	4- Occasionally	7- Often
7. How mentally alert do you feel at the present time?	1- Not Alert	4- Moderately	7- Fully Alert
8. Do you ever become so involved in a movie that you are not aware of things happening around you?	1- Never	4- Occasionally	7- Often
9. How frequently do you find yourself closely identifying with the characters in a story line?	1- Never	4- Occasionally	7- Often
10. Do you ever become so involved in a video game that it is as if you are inside the game rather than moving a joystick and watching the screen?	1- Never	4- Occasionally	7- Often
11. On average, how many books do you read for enjoyment in a month?	1- None 2- One 3- Two 4- Three 5- Four 6- Five 7- More		
12. What kind of books do you read most frequently? — (CIRCLE ONE ITEM ONLY!)	Spy novels Fantasies Science fiction Adventure		

	Romance novels Historical novels Westerns Mysteries Other fiction Biographies Autobiographies Other non-fiction		
13. How physically fit do you feel today?	1- Not fit	4- Moderately Fit	7- Extremely Fit
14. How good are you at blocking out external distractions when you are involved in something?	1- Not very good	4- Somewhat Good	7- Very Good
15. When watching sports, do you ever become so involved in the game that you react as if you were one of the players?	1- Never	4- Occasionally	7- Often
16. Do you ever become so involved in a daydream that you are not aware of things happening around you?	1- Never	4- Occasionally	7- Often
17. Do you ever have dreams that are so real that you feel disoriented when you awake?	1- Never	4- Occasionally	7- Often
18. When playing sports, do you become so involved in the game that you lose track of time?	1- Never	4- Occasionally	7- Often
19. Are you easily disturbed when working on a task?	1- Never	4- Occasionally	7- Often
20. How well do you concentrate on enjoyable activities?	1- Not At All	4- Moderately Well	7- Very Well
21. How often do you play arcade or video games? (OFTEN should be taken to mean every day or every two days, on average.)	1- Never	4- Occasionally	7- Often
22. How well do you concentrate on disagreeable tasks?	1- Not At All	4- Moderately Well	7- Very Well
23. Have you ever gotten excited during a chase or fight scene on TV or in the movies?	1- Never	4- Occasionally	7- Often
24. To what extent have you dwelled on personal problems in the last 48 hours?	1- Not At All	4- Some	7- Entirely
25. Have you ever gotten scared by something happening on a TV show or in a movie?	1- Never	4- Occasionally	7- Often

26. Have you ever remained apprehensive or fearful long after watching a scary movie?	1- Never	4- Occasionally	7- Often
27. Do you ever avoid carnival or fairground rides because they are too scary?	1- Never	4- Occasionally	7- Often
28. How frequently do you watch TV soap operas or docu-dramas?	1- Never	4- Occasionally	7- Often
29. Do you ever become so involved in doing something that you lose all track of time?	1- Never	4- Occasionally	7- Often

Appendix 10: NASA Task Load Index

Title	Endpoints		Descriptions
Mental Demand	1-low	10-high	How much mental and perceptual activity was required (e.g., thinking, looking, searching, etc.)? Was the task easy or demanding, simple or complex, exacting or forgiving?
Physical Demand	1-low	10-high	How much physical activity was required (e.g. pushing, pulling, turning, controlling, activating, etc.) Was the easy or demanding, slow or brisk, slack or strenuous, restful or laborious?
Temporal Demand	1-low	10-high	How much time pressure did you feel due to the rate or pace at which the tasks or task elements occurred? Was the pace slow and leisurely or rapid and frantic?
Effort	1-low	10-high	How hard did you have to work (mentally and physically) to accomplish your level of performance?
Performance	1-good	10-poor	How successful do you think you were in accomplishing the goals of the task set by the experimenter (or yourself)? How satisfied were you with your performance in accomplishing these goals?
Frustration level	1-low	10-high	How insecure, discouraged, irritated, stressed and annoyed versus secure, gratified, content, relaxed and complacent, did you feel during the task?
Hart, & Staveland (1988).			

Appendix 11: IGroup Presence Questionnaire

question	Factor	Ratings 1-7	Original source
In the computer generated world I had a sense of "being there".	General presence	Not at all – very much	Slater & Usoh (1994)
Somehow I felt that the virtual world surrounded me.	Spatial presence	Fully disagree – fully agree	IPQ
I felt like I was just perceiving pictures.	Spatial presence	Fully disagree – fully agree	IPQ
I did not feel present in the virtual space.	Spatial presence	Did not feel – felt present	Unknown
I had a sense of acting in the virtual space rather than operating something from the outside.	Spatial presence	Fully disagree – fully agree	IPQ
I felt present in the virtual space.	Spatial presence	Fully disagree – fully agree	IPQ
How aware were you of the real world surrounding while navigating in the virtual world? (i.e. sounds, room temperature, other people, etc.)?	Involvement	Extremely aware – moderately aware- not aware at all	Witmer & singer (1994)
I was not aware of my real environment.	Involvement	Fully disagree – fully agree	IPQ
I still paid attention the real environment.	Involvement	Fully disagree – fully agree	IPQ
I was completely captivated by the virtual world.	Involvement	Fully disagree – fully agree	IPQ
How real did the virtual world seem to you?	Experienced realism	Completely real – not real at all	Hendrix (1994)
How much did your experience in the virtual environment seem consistent with your real world experience?	Experienced realism	Not consistent – moderately consistent – very consistent	Witmer & Singer (1994)
How real did the virtual world seem to you?	Experienced realism	About as real as imagined world – indistinguishable from the real world.	Carlin, Hoffman & Weghorst (1997)
The virtual world seemed more realistic than the real world.	Experienced realism	Full disagree – fully agree.	IPQ

Appendix 12: Semi-Structured Interview

Semi structured interview

1. Please describe the route that you took through the house and why.

2. Was this route planned in anyway? If so, please explain why you planned to do it this way.

3. Please justify the time that you took to burgle the house.

4. Please explain why you took the items that you did.

5. Please talk about the relationship between the items you took and the route that you took.

6. Were there any items of which you second guessed yourself on or even dropped and left? If so, please explain your thought process behind these actions.

7. Please talk about anything that you saw in the house that you did not expect to see.

8. Are there any other aspects of the mock-burglary that you would like to discuss?

9. Do you have children?

10. Do you live in a household containing children?

Appendix 13: Virtual Burglary Scenario

I would like you to imagine you're walking along a street and you pass a family of four; a mum, dad, their adolescent son, and a baby.

As you pass them, you overhear the mum say that they'll be back in 5 minutes as they are only going to the store.

You noticed what house they came out of and see that they did not lock the door. You decide to burgle them.

Appendix 14: Merry and Harsent's (2000) typology characteristics

Implicit interpersonal script/Low Craft (Pilferers)	Implicit Interpersonal Scripts / High Craft (Raiders)	Explicit Interpersonal Script / High Craft (Invaders)
Forced Entry	Forced Entry	Forced Entry
Multi-rooms	Multi-rooms	Multi-rooms
Audio-Visual	Audio-Visual	Audio-Visual
Identifiable property	Identifiable property	Identifiable property
Secondary insecurity	Over 5 items stolen	Offender security
Cash	Value over 500	Curtains drawn
Cards	Antiques	Prepared exit
Children	Camera	Tools
Carrier Taken	Music	Window
Alcohol	Clocks	Strewn
		Jewels
		Watch
		Small electrical
		Ornament

Appendix 15: Fox and Farrington's (2012) typology characteristics

Opportunistic			
Entry left open	No tools or prep	Low value	Little evidence left
Organised			
Clean but forced	No evidence left	High value items taken	Tool or prep
Disorganised			
Forced entry	messy	Tools or evidence left	Low or no value